

~~SECRET~~

NIAGARA Control Center. The Control Center in turn, provided a current and complete picture of known enemy dispositions around Khe Sanh. Effective application of the total air effort depended on the validity of that "picture." The defense of Khe Sanh became, to this extent, dependent on the generation of valid targets in Saigon, 375 miles away. Tan Son Nhut Air Base, with its photo processing and exploitation, and array of supporting intelligence capabilities, became the source of air targeting data for the entire effort. Later debriefing of the Officer in Charge (OIC) of the Regimental Fire Support Center revealed that NIAGARA Control's Hot Item Reports and nightly computer runs were employed in laying on artillery and Marine close-in air support as well. ^{102/}

A variety of resources were exploited to build the target data base. One primary source was the Human Intelligence (HUMINT) collection program--interrogation of POWs and other local sources. Some of the earliest definitive information on enemy plans for Khe Sanh came from human source intelligence. From 22 January through 31 March, an Air Force interrogation team based at DaNang submitted approximately 100 special reports responsive to 7AF, MACV and PACAF requirements. One of the first examples covered the interrogation on 19 January of an NVA First Lieutenant. He provided the DaNang team with information on the enemy's offensive planning. He reported plans for a division-sized attack against Khe Sanh, the movement of tanks into the DMZ area for employment in SVN, and plans for attacks on other Marine DMZ positions. Reports of this kind were passed directly to NIAGARA ICC, where an all-source effort was operative to translate them into air targets. Reported bivouac areas, supply points and command posts,

~~SECRET~~

once plotted on maps, were researched in photography. Often, new reconnaissance was flown to exploit HUMINT data.^{103/}

A variety of specialized sensors, combining electronic, seismic and acoustic techniques, also provided inputs. The information was necessarily fragmentary--the precise location and nature of the types of activity detected required skilled interpretation or more often, educated guesswork. The unique value of the sensors was that they operated 24-hours a day throughout the enemy occupied area.^{104/}

Each intelligence source in its own way penetrated the tree and cloud cover which so often frustrated photo reconnaissance. The full value of the entire range of intelligence sources and special sensors was realized in NIAGARA under the impact of an intensive all-source intelligence effort. Separate inputs acquired increasing value as they were combined with other data, adding together to define new targets.^{105/}

Eventually, all target data was reduced to precise locations identified on photography. Target folders were then prepared for FACs and strike crews, and accurate eight-digit UTM coordinates provided for Arc Light and artillery use.^{106/}

The amount of aerial reconnaissance flown during Operation NIAGARA almost doubled the film footage normally processed by 7AF facilities. As the workload passed 100,000 feet of film per day, a 70 per cent augmentation

~~CONFIDENTIAL~~

in Photo Interpreter (PI) strength was effected. This permitted a 24-hour operation at full strength of 50 PI's and included both Air Force and TDY Army personnel. 107/

Although the NIAGARA photo exploitation effort was large, there was evidence that it was still not large enough to capitalize on the available reconnaissance. During February, adverse weather cut total reconnaissance sorties in half. With twice as much time to exploit available imagery, the interpreters found nearly four times as many targets as in any other period. The "lesson learned" in this case was that the interpretation capability was seriously out-paced by the volume of reconnaissance flown. 108/

A special report by Hq 7AF for publication in the Weekly Air Intelligence Summary (WAIS) explained: 109/

"The In-country Reconnaissance effort is managed by MACV. Since the NIAGARA area involved both the Republic of Vietnam and Laos, a reconnaissance section was created in the Intelligence Task Force and given the authority to provide centralized management of the entire reconnaissance effort for all of NIAGARA. One office was now responsible for determining reconnaissance requirements and priorities and for making optimum use of the full range of photographic sensors (black and white, color, camouflage detection, infrared and high acuity) as well as electronic systems. The entire reconnaissance effort in NIAGARA was directed toward a single objective--to locate the enemy so the full impact of air power could be brought to bear against him, in the defense of Khe Sanh. This produced the most intensive reconnaissance program initiated so far in support of the Vietnam War.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

"There were 1,616 reconnaissance sorties frugged during Operation NIAGARA. 1,453 sorties were flown which covered a total of 1,994 reconnaissance objectives - specific ground locations ranging in size from a small pinpoint to a large area involving several hundred square miles.

"...Ninety percent of all sorties frugged were flown in spite of the inclement weather that prevailed during most of Operation NIAGARA. Reconnaissance information was so critical and urgently needed that missions were flown even if there was only a 5 - 8% chance of success."

The management of intelligence resources and the orderly flow of materials for this massive targeting effort required a task organization that was autonomous with respect to the regular intelligence staff and its routine workload. To provide this, the NIAGARA Intelligence Control Center at Tan Son Nhut had immediate access to imagery interpreters and their materials, and direct support from other 7AF intelligence agencies. At its peak, the NIAGARA ICC was staffed by 213 personnel drawn from various elements of Seventh Air Force, 7/13AF, MACV, the Philippines, Hawaii and CONUS. ^{110/}

NIAGARA Control profited from the in-place 7AF Intelligence Data Handling System (IDHS). Adapting existing resources, IDHS published the first Niagara Target List within 18 hours of its activation. Thereafter, a daily up-date target list was produced and transmitted to MACV, to the 26th Marine Regiment Fire Support Center at Khe Sanh, and to the 7AF strike planners. The file eventually covered over 2,000 targets, with entries detailing target identity, strike history, BDA and reconnaissance coverage.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

The "Niagara File" then was integrated into the "in-country" target data base. ^{111/}

As a result of this reconnaissance effort, 623 major targets were produced for strike aircraft--a rate of 1.4 targets per reconnaissance sortie. These findings collated with other intelligence resulted in 2,095 individual targets being nominated for strike. Nine hundred and seventy-eight were struck, 67 percent being attacked under CSS radar control. At the close of the operation, 1,483 targets had been deleted as a result of airstrikes and changes in status--from occupied to unoccupied--leaving 612 to be undertaken as part of the air support to be provided to the U.S. 1st Air Cavalry's counter-offensive operation in the area following the termination of NIAGARA on 31 March. ^{112/}

A reconnaissance section was established in the Intelligence Control Center to manage each facet of the reconnaissance and imagery exploitation cycle of the targeting program. This office determined requirements and priorities and scheduled imagery exploitation. Optimum use was made of the full range of photographic sensors (black and white, color, camouflage detection, infrared and high acuity), as well as electronic systems. Sensor selection was based on operational factors and the capabilities of individual systems to meet specific reconnaissance requirements. Nearly a million feet of film was processed in the development of these targets.

~~CONFIDENTIAL~~

Over half of the objectives were covered on black and white photography. ^{113/}
Use of color and camouflage detection was governed by the nature of the targets and by the availability of supplies, processing equipment and the need for low level flights. Experience with regard to color and camouflage detection imagery in NIAGARA showed that for optimum utilization of these sensors: ^{114/}

- . Color/Camouflage Detection should be flown between 1000-1500 hours.
- . Area and route segment coverage should be restricted to locations of known or highly suspected activity.
- . SAM, AAA, and AW sites are especially vulnerable to these sensors.
- . They should be flown on relatively cloud free days and not over unbroken jungle canopy.
- . In all instances, the lower the altitude the more productive the results.

By 27 January, the NIAGARA target development effort peaked at the rate of 300 targets in one day. The rate then leveled off. At its conclusion on 31 March, target development averaged 150 a day. ^{115/}

Many lucrative targets continued to be developed in the NIAGARA area although the estimated major assault against Khe Sanh did not materialize. ^{116/}

Among the unusual types of targets developed during NIAGARA were numerous caves, identified by intelligence as a possible enemy headquarters. The distinctive limestone formations of the Annamite Mountains lent themselves to such use. Figures 9, 10, and 11 depict several of the more

~~CONFIDENTIAL~~

important caves, both before and after strikes. All were located in the northwestern corner of the NIAGARA area, the furthest 25 nautical miles from Khe Sanh. ^{117/}

One of the most lucrative targets, a primary ammunition and supply area at XD 765227 -- in the Co Roc Mountain area approximately 19 kilometers SSW of Khe Sanh, was reported on 15 February. Covey 673 directed two F-100s against this target at approximately 0425 hours on the 15th, and the strike resulted in three secondary explosions and one secondary fire. This strike was followed at 0848 hours by two A-1Es (Hobo 35) loaded with two BLU 32s, four LAU 59s, two M117s, and four frag bombs each. These Hobos worked the area for almost one hour, and Covey 673 reported that they had destroyed one primary supply area of 150 wooden crates and an ammo cache of 50 to 75 wooden crates. The Hobos also uncovered a 200 meter long trench with crates of ammunition stacked three high. Covey 673 observed the area still exploding and burning after two and one-half hours. ^{118/}

The Coveys continued to direct strikes against this target all day on the 15th, recording well over 1,000 secondary explosions and fires. As one FAC reported: ^{119/}

"This area is an extremely lucrative target that continues to grow in size and importance as more bombs open up and uncover more and more supply areas and ammo caches. Hobo 35 and Warpaint 300 (2 A-4s) have opened up extensive underground

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

trenches 200 meters long with hundreds of crates of ammo. This appears to be a major portion of supply area. All areas struck with exception of two caves and 200 meter camouflaged trenches. Recommend Sky Spst throughout evening to prevent relocation of supplies. FAC received light SA fire from three kilometers south of target."

At 0200 hours on the following morning, Covey 673 VR'd this same area for ammunition and supply caches, and sighted signs of activity during the night. The previously reported trench filled with crates of ammunition had been partly emptied; the removed crates had been emptied and left in the area. However, there were still four large caches in the trench ranging "from 50 crates and up", about 2 x 2 feet and 3 x 9 feet in size. There were also a great number of crates and bags of rice stored above ground. Between 0259 and 0541 hours on the 16th, Covey 673 directed several more flights in against this target, reporting positive results. Since this target could well have been a major staging area for future attacks against Khe Sanh, the FAC strongly urged positive action be taken immediately to deny these supplies to the enemy. He suggested the following plans: 120/

- Helicopter-landing a reaction force to discover the extent of storage, plant demolition, and extract. FAC had received negative ground fire and had seen no active enemy defenses in the area.
- Continuous day bombing by A-1E with napalm. Easily the best results had been achieved by this FAC with A-1E pinpoint placing of napalm and strafe. This is considered to be especially important where targets are in a confined area and require direct hit to destroy.

~~CONFIDENTIAL~~

~~SECRET~~

Extensive ARC LIGHT for area coverage. FAC believed that an aggressive combination of these possible solutions could deny these supplies to the enemy.

The Hillsboro ABCCC mission report for 16 February commented:
"I would like to commend Covey 673 for the outstanding FAC job he has done the last three days. It is the best I have seen in the 20 months I have flown Hillsboro. Stream of strikes set up to cover area...
to continue through the night." ^{121/}

With the 7AF TACC controlling the effort through the ABCCC, tactical air was able to respond more rapidly to targets acquired. Flights could be readily diverted from fragged targets to strike immediately under FAC control as required. For instance, hot item targets, which were by definition an immediate threat and transitory, when developed by the Intelligence Task Force were passed immediately to the TACC. In turn, the TACC would make direct contact with the ABCCC to place an immediate strike on the target. ^{122/}

The single greatest hindrance to target acquisition and tactical response in the NIAGARA area was the northeast monsoon, for which the enemy had planned to his advantage. During January, February, and part of March, weather in NIAGARA was extremely bad, restricting visual acquisition of targets and ordnance delivery. Much of the time, heavy clouds engulfed the mountain peaks throughout the area, while fog hugged the valley floors around Khe Sanh. Because of this, a high percentage of tactical strikes had to be directed into the target area by MSQ or

~~SECRET~~

~~SECRET~~

Marine TPQ ground directed radar bombing units. ^{123/}

During the first 29 days, before the monsoon peak had passed, a daily average of 65.2 percent of all ABCCC controlled NIAGARA strikes were directed by these Combat Skyspot radar systems. It is logical to assume that an equally high number of other tactical air strikes (controlled by other agencies during the early part of NIAGARA) were flown into the area under ground radar direction. A Marine TPQ was actually positioned at the Khe Sanh Base Camp, and according to Covey FACs who observed strikes directed by this unit, it was highly accurate in directing strikes in its own defense--more so than units positioned further away. ^{124/}

The Coveys also worked with the fighters making strikes under Skyspot direction, and often assisted by reporting results and target adjustments to the fighters. At times, when not forewarned of Skyspot strikes in the area, the Coveys have found themselves in the unenviable position of ordnance being expended over the area in which they were flying. ^{125/}

One of the 7AF liaison officers, who was also a Covey FAC, at Khe Sanh considered the TPQ located there to be one of the primary weapons systems for defense of the base. It was also considered to be a primary target for enemy artillery being applied against Khe Sanh. The liaison officer noted that if a major assault against the base had been made, this TPQ could "effectively be used against enemy forces

~~SECRET~~

~~SECRET~~

in close proximity," while the effectiveness of units located further away would be questionable. He made the suggestion that a back-up TPQ be provided at Khe Sanh, since the enemy could well score a direct hit against the single unit. Although this system was out of commission for periods of short duration, it was fortunately not demolished by incoming fire. ^{126/}

Another factor which had an impact on effective application of tactical strikes was obvious: ordnance on occasion being incompatible to terrain or targets being struck. This, of course, is always a primary consideration in tactical air application; however, ordnance selection considerations were compounded in NIAGARA due to the great amount of airpower being applied in the area, and the great variety of tactical target situations which could develop. A good example of ordnance incompatibility was reported in the Lang Vei attack, when immediately available tactical aircraft were armed with heavy bombs, and the ground situation precluded the effective application of such ordnance. Problems in ordnance selection were more prevalent during the first few weeks of NIAGARA, when certain coordination and control conditions adversely affected tactical planning. This will be discussed more fully under "Coordination and Control".

By late February, the 7AF Director of Combat Operations advised all tactical units that "it is becoming increasingly imperative" that the pressure on enemy forces and the effectiveness of strikes "be maximized". ^{127/} Not only had the pressure against Khe Sanh become

~~SECRET~~

~~SECRET~~

more intense, but the enemy had actually burrowed in around the Khe Sanh perimeter. One trench was discovered extending beneath the base defense wire, and it was estimated that the enemy might attempt to tunnel beneath the defensive positions and plant explosives. A III MAF report noted: ^{128/}

"On 25 February, a 3rd Mac Div AO observed a trench extending due north to within 50 meters of the Khe Sanh Combat Base perimeter. This new trench is an extension of the trench network reported in earlier message. This represents approximately 700 meter extension in less than 24 hours. New trench is reported to be two foot wide, approximately four foot deep and terminates in a trench approximately 50 meters long running parallel to Khe Sanh wire. Another trench was observed, and the AO received intense automatic weapons fire from trenches and surrounding area "

The 7AF Commander continued to place emphasis on the effective application of tactical airpower against targets developed in the Khe Sanh area. The around-the-clock weight of effort was sustained against these targets, and a special office had been established within the TACC to closely monitor the NIAGARA effort, and keep the commander and his staff posted. Also, a separate frag team had been formed to develop the NIAGARA ^{129/} frag order -- to more effectively apply the total weight of effort. In accordance with this command emphasis, 7AF tactical units were given the following directions on 26 February:

"All strike pilots and FACs will be briefed prior to next flight on the criticality of the ground situation and the urgency of using every means to press home the

~~SECRET~~

~~SECRET~~

attack. Specifically, release altitudes for dive deliveries must be reduced to minimums to improve accuracy in destroying pin point targets and effecting road interdictions. Upon completion of dive deliveries, maximum time, within fuel limitations, will be spent on armed reconnaissance of routes and key LOCs in the target area with first priority on Route 9 and Route 922... The areas along Route 9 and 922 are loaded with supplies cached on either side of the road and troops have also been seen in these areas. If no specific targets are found the FACs will direct flights to expend 20-mm in strafing runs along the sides of the roads from the road bed to 50 to 100 yards out.

Any areas from which secondary explosions or fires are observed will be struck by follow-on flights. FACs are directed to be especially alert for tanks, trucks and armored vehicles parked close to roads and rivers and for POL drums and other supply caches.

It is imperative that Route 9 from Tchepone to Khe Sanh be maintained unserviceable with maximum interdiction effort. F-105s diverted from Alpha Package will be carrying 1/3 time delay bombs and will be given priority for interdiction strikes along Route 9.

To assist intelligence gathering efforts, maximum use will be made of gun cameras, KA 7i and strike cameras with film forwarded through intelligence channels to 7AF DI.

The urgency of immediate increased pressure on the enemy forces is of the highest priority and every effort is directed to maximize the effectiveness of our air resources."

Several tactical strikes in immediate support of Khe Sanh near the end of February were reported to be very productive. Strikes on 25 February were a good example. Just before noon on the 25th, the ABCCC reported that Khe Sanh was under heavy fire from rockets and mortars. Although the NIAGARA area was "generally unworkable" except by Combat Skyspot during this period, portions of the western area opened for short

~~SECRET~~

~~SECRET~~

periods at midday for visual strikes. Khe Sanh was in this western portion, and the Covey FACs spotted seven rocket and mortar positions which were directing fire against the base. A-1s with soft ordnance were immediately diverted to strike these targets. ^{131/} The Coveys also directed jets in against the guns, and the combined strikes silenced them. All seven positions were reported destroyed or damaged. ^{132/}

Every break in the weather was exploited to conduct visual strikes against the enemy forces immediately threatening Khe Sanh. On the previous day, the 24th, the weather had broken around Khe Sanh during the afternoon, and Hillsboro reported: ^{133/}

"Flights with napalm and high drags were scrambled throughout the afternoon against troop concentrations and gun emplacements in the Khe Sanh area..."

While continuing to press attacks against active targets in the vicinity of Khe Sanh at every opportunity, tactical fighters also continued to interdict enemy logistical movement into the area. Heavy traffic continued to be noted on all routes and trails in all of the NIAGARA area, the Laotian corridors, and Route Package I. The ABCCCs constantly reported that the FACs were involved with strikes against truck parks and moving vehicles. For instance, on 23 February, the "Alleycat" ABCCC reported that strikes in Route Package I had destroyed 43 trucks and two probably destroyed. These strikes also produced 36 secondary explosions and 25 fires. ^{134/}

~~SECRET~~

~~SECRET~~

One example in the NIAGARA area occurred on 24 February. After the TACC briefed the "Hillsboro" ABCCC on a truck park discovered by NIAGARA photographic reconnaissance taken on 17 January, Covey 671 checked on one of the coordinates, XC808843, and reported it to be a very likely area. After two flights worked the target, Covey 671 reported the largest bunker he had ever seen. A total of six flights produced six secondary explosions and one bunker destroyed. ^{135/} Earlier, on 22 February, the Coveys had directed strikes against numerous trucks, and reported twelve were destroyed. They also reported nine secondary explosions and 14 fires. ^{136/}

"Nail" FACs from Nakhon Phanom working the STEEL TIGER interdiction area near NIAGARA also continuously sighted trucks which were probably supporting the enemy around Khe Sanh. In one instance, on 24 February, Nail 47 sighted a truck towing a howitzer. The truck was moving east toward Khe Sanh with the weapon. Both the truck and the howitzer were destroyed by two tactical flights. ^{137/}

Covey FAC reports indicated that despite the continuous interdiction effort, the enemy continued to move, often over what were considered to be impassable trails. Roads were under constant repair. For example, in late February, Coveys 123 and 135 reported on the condition of Route 9: ^{138/}

"VR'd Route 9 between Tchepone and Khe Sanh. Route is being used by both trucks and tracked vehicles. Tread tracks observed entire length of Route VR'd. Repair

~~SECRET~~

~~SECRET~~

work is being done over the entire length of this road. Culverts are being constructed to replace destroyed bridges and fords. Road cuts and ford cuts are apparently ineffective along this route at this time as they are all being bypassed or repaired immediately."

On the same day, Covey 658 reported on enemy road repair: ^{139/}

"Observed 100 meters of road 15 ft wide running north to south through a deep depression with heavy foliage along both sides. One week ago only ten meters of this road was observed."

Seeding the roads with MK36 mines was also accomplished. The overall effect of these missions was considered to be favorable; however, there were occasions when a mission proved ineffective. One FAC reported one instance in which the mines were observed "going off right after seeding took place". This caused a chain reaction setting off several others. He suggested that the MK36 be used on Route 9 and fords in the evening hours. In the event of similar occurrence, disruption of night traffic might be effected even though the seeding mission failed. ^{140/}

While pressing the attack against the enemy, the FACs and fighters faced very heavy and accurate enemy ground fire. One FAC reported on his experience during the first few weeks of the operation: ^{141/}

"We have had a difficult time determining any kind of pattern of enemy fire. Small arms in some areas is very intense. Generally, they won't open up with small arms unless you have found something, or they really have something they want to protect. One experience really caught me off guard. I was a few miles from

62

~~SECRET~~

(This page is ~~CONFIDENTIAL~~.)

~~SECRET~~

Target 10, which had been previously identified as a pretty heavy triple A threat area. Being new at the time, I wasn't familiar with it. They really opened up on me, before I spotted anything. I applied the general tactic, which is to turn a lot and get as close to the ground as possible, and departed the area.

We came back in later on a VR flight, about two miles from the hot area, and again they started opening up on us. Real heavy fire; they chased us around the sky for a long time. We finally located the guns and determined that there were ten or twelve 37mm guns sitting out around Target 10, all revetted."

Judging from past combat experience, weapons discipline was a basic characteristic of seasoned enemy forces in Vietnam. Normal FAC experience was that seasoned enemy troops would not open fire on aircraft until certain of FAC detection, i.e. FAC aircraft loitering over the target for an extended period or actually directing fighters to the target. ^{142/}

In Operation NIAGARA, however, FACs on more than one occasion found themselves being fired upon, without having detected enemy positions. This probably resulted from the large number of enemy forces in the area and the continuous air activity. In view of the fact that all forces in the area were NVA soldiers, it would appear logical that they were well trained troops, if not seasoned veterans. They were certainly well armed; practically every enemy position and vehicle convoy had anti-aircraft fire support. This is reflected in the following excerpts from FAC reports during one four day period in late February: ^{144/}

Covey received 23-mm fire from four positions north of target 674. The fire was very accurate from all four positions. FAC suggests guns are radar controlled

~~SECRET~~

~~SECRET~~

because fire from all positions converged into close proximity of FAC. FAC was at 6500 ft AGL and the rounds were bursting both above and below the aircraft. The line of fire from positions was straight at the aircraft and came very close to hitting. The night was very dark with no moon and aircraft did not have lights on and still fire was very accurate. It would be impossible to come this close to hitting the aircraft by shooting at a sound at 6500 ft AGL.

FAC received heavy 37-mm fire from one position west of target 713 and eight to ten positions approximately 1000 meters south of target 713. FAC received approximately 500 rounds from one position. 37-mm was extremely accurate. Weapon probably centrally controlled.

FACs received 250-300 rounds, inaccurate fire bursting at 10,000-14,000 feet from 10 37-mm positions. FAC recommends suppressor fighter aircraft be made available both night and day for the Target 4107 and 713 interdiction points. Intense 37-mm fire from these points virtually makes it impossible to put in strike aircraft. Hard ordnance is almost useless at night. Recommend CBU-24 and CBU-29.

VR'd Route 96 from D-39 to D-89. Sighted with Starlight scope four trucks going north. While following the trucks, FACs received 50-cal fire from a position just north of the trucks. FAC suspects the AA weapon was mounted on a truck as the fire seemed to come from the road. While FAC was evading the AA fire, he sighted three vehicles moving south. While watching these trucks, FAC received 23-mm fire from the vicinity of target 621. While evading this fire, FAC also drew fire from a 23-mm position in the vicinity of target 674.

Coveys 673 and 642 sighted numerous fires in vicinity of road throughout target area. Trucks were picked up moving through these fires. FAC had difficulty with situation and believes fires are being used to obstruct observation of area for vehicle movement. FAC recommends

~~SECRET~~

SECRET

heavy ordnance on interdiction points in target 4107 and target 713 area. Target 713 has many gun positions defending this area making it almost non-permissive for FAC type aircraft.

The enemy threat in the NIAGARA area did not appear to wane by the end of February; however, his one major advantage--the north-east monsoon--was on the decline. Although there would still be days of inclement weather in March, there would also be more breaks in the weather--making the enemy more vulnerable to pin-point targeting and visual expenditure by tactical fighters. At this point, the 7AF Commander reported to COMUSMACV: ^{145/}

"In the first thirty-nine days of Operation NIAGARA, U.S. Air Forces--Tactical, Naval, Marine and Strategic--have dropped fifty-three thousand four hundred tons of ordnance in support of the defense of Quang Tri Province...

"This effort has produced more than two thousand five hundred secondary explosions, nearly one thousand secondary fires, and has destroyed or damaged one thousand structures and bunkers. More than one hundred trucks have been destroyed, and unknown number of enemy soldiers have been killed or wounded. Captured documents and prisoners continue to reflect postponement of scheduled operations and destruction of LOCs. These results, impressive as they are, reflect the achievement of slightly more than one-half of the thirteen thousand three hundred effective strike sorties that were flown between 22 January and 29 February. The damage caused by the remainder, forced by

SECRET

poor weather, to release munitions under radar control, cannot be assessed directly. The air support so far rendered to land forces in Operation NIAGARA is unprecedented in the history of aerial warfare. Although these operations appear to have contributed much to thwarting the enemy's plans, they should not be looked upon as an effective substitute for those ancillary ground actions which alone can frustrate the enemy's effort to move into and under the Khe Sanh base."

ARC LIGHT Responsiveness

As previously noted, the destructive bombing capability of the B-52 ARC LIGHT force was a key element in the sustained NIAGARA effort. MACV targeting for the B-52s and actual strike operations were underway prior to the beginning of sustained tactical strikes on 22 January. According to MACV officials, established procedures prior to NIAGARA had been tailored to strike relatively stable, well-known targets. With the commencement of NIAGARA, the requirement was for rapid response of the B-52s to targets as they were developed. To accomplish this rapid response capability, the area of interest was overlaid with a system of preplanned grids with each grid comparable to the area covered by a B-52 mission. This provided a means for rapid coordination between the ground and the air officials in the preparation and strike of selected targets. It also provided the capability to divert the B-52 strike aircraft within ^{146/} three hours of bomb release.

The Intelligence Control Center generated targets 24 hours a day, as ground units and specialized sensors fed in new data. Tactical air responded on short notice, dropping under radar control if weather or

~~SECRET~~

darkness precluded visual attack. New procedures were devised under the nickname BUGLE NOTE which enabled the B-52s to respond with similar flexibility. The NIAGARA area was overlaid by a grid system in which each "box" represented a 1 x 2 kilometer target, an area that could be effectively covered by one cell of B-52s. Under the new concept, every one and one half hours, a cell of three B-52 aircraft would arrive at a predesignated pre-IP to be picked up by MSQ and directed to one of a series of IPs and then to a specific target. The target could be changed each one and one half hours or could be kept the same for each arriving force until required at another aiming point. With regard to B-52 targeting, SAC explained: ^{147/}

"To further simplify mission planning and stabilize reaction, secondary/alternate targets would preferably be located in the Kontum/Dak To area. These targets must be capable of supporting the entire effort. Once fragged, the alternate/secondary target must remain in effect."

SAC explained that the B-52s would be expending ordnance on a target in the area of concern every one and one half hours. These TOTs could be varied to as low as one hour spread or increased to two hours as necessary to preclude establishing a TOT pattern for the enemy. The timing of this operation was described as follows: ^{148/}

"A cell of three B-52s would take off from Andersen every three hours and proceed to its MSQ pick up point pre-IP and then through IP to target arriving as an example at 1200Z, 1500Z, 1800Z, etc. Every three hours a cell of three aircraft would take off from U-Tapas and proceed to its assigned MSQ pick up point pre-IP and through IP to target arriving there at 1300Z, 1630Z, 1930Z, etc."

~~SECRET~~

Certain limitations are inherent in an operation of this type. SAC listed the following: (1) MSQ must have a target for a cell to drop every one and one half hours, (2) No other ARC LIGHT targets could be attacked during the period this emergency operation is in progress, i.e. 48 sorties per day during emergency in I Corps area, (3) and, for strikes in the SAM Watch Zone, TINY TIM (EB-66s) would be required. ^{149/} CINCPAC cautioned that the cyclic type of operation conducted under BUGLE NOTE would permit the enemy to arrive at rather accurate estimates of the time the B-52s would be in the vulnerable area. Thus, the enemy would have an increased potential to exploit his capability to launch a MIG attack against B-52s in northernmost I Corps. "All forces need to be particularly alert to this new dimension of the threat," CINCPAC advised. ^{150/}

SAC also advised that it was prepared to support ARC LIGHT with alternately six or nine sorties per day from the Port Bow (Korea Contingency) resources located at Kadena AB, Okinawa "subject to JCS approval and availability of weapons". ^{151/} COMUSMACV concurred fully with the SAC proposal, and requested CINCPAC approval. Regarding the use of Kadena resources, COMUSMACV requested two additional strikes of six aircraft per day, if available and approved. These would be in addition to the 48, and would be utilized below the 14 degree parallel. COMUSMACV made ^{152/} the following points relative to BUGLE NOTE Implementation:

Secondary targets when required would be designated and submitted twelve hours prior to effective time.

~~SECRET~~

TINY TIM support would consist of EB-66 coverage in the SAC designated SAM Watch Zone.

Iron Hand would be provided whenever the target route penetrated a known or suspected SAM ring.

The use of BLU munitions was considered and not deemed feasible for the operation due to troop clearance requirements and lack of flexibility to use secondary/alternate targets. However, BLU munitions would be requested on specific targets when they could be used to advantage.

CINCPAC approval was obtained, and the BUGLE NOTE concept was implemented on 15 February, along with the sortie increase through use of the Kadena B-52s. In NIAGARA, this meant around-the-clock B-52 operations -- 16 missions per day with three aircraft each over the target every one and one-half hours. Shortly after implementation of this improved concept in NIAGARA, COMUSMACV requested that a BUGLE NOTE capability be developed for certain other key target zones in South Vietnam. Five days after NIAGARA terminated, the Chief, SAC ADVON, at Hq 7AF reported on BUGLE NOTE developments to that time: ^{153/}

"... 3AD supplies ten six ship sorties a day to pre-determined IP gates and SAC/ADVON/TACPAL provides target information to the MSQ sites. A southern and central BUGLE NOTE capability has also been developed and MACV now has an ARC LIGHT reaction capability (by target selection or change) of three hours. In the few areas not covered by BUGLE NOTE IPs, the usual 24 hours in advance preplanned missions will be used. The sortie rate and this target change capability down to within three hours of TOT has resulted in elimination of the Quick Run Alert Force.

~~SECRET~~

ADVON is now fulfilling the original Terms of Reference in functioning as the operational planning agency. We select all TOTs, weaponeer the target, recommend axis of attack and base to provide the strike for preplanned missions. All of the BUGLE NOTE planning from pre-IP through target is the sole responsibility of ADVON. The relationship with MACV is excellent and their actions are now primarily concerned with target evaluation and selection..."

L

Another significant development concerned a relaxation of the rules for B-52 strikes. Prior to NIAGARA the B-52s were restricted from expending their ordnance to within three kilometers of friendly positions. On 13 February, COMUSMACV advised CINCPAC that the tactical situation at Khe Sanh and in other areas of Quang Tri, such as Con Thien and Camp Carroll, "may require that full defensive fires be brought into close proximity of defensive positions". He recommended that the 3 kilometer clearance from friendly combatants be rescinded, and that this clearance be determined on the basis of the tactical situation, by the tactical commander, as approved by Hq MACV.^{154/} The clearance limitation was subsequently relaxed to one kilometer from friendly combatants.^{155/}

Discussion of the B-52 effectiveness in the NIAGARA area will be covered in the operational summary. Prisoner and captured document information relative to B-52 strikes will also be presented in that section; however, it seems appropriate to conclude this section of the study with the comments of one Marine ground commander relative to the results of one B-52 strike of 9 February. On this date, this officer's unit received the support of two ARC LIGHT strikes, one at 1700 hours and one at 1750. He reported:^{156/}

~~SECRET~~

"All in the area were awed at the devastating accuracy and destruction displayed by your pilots and weaponry. For the past two weeks enemy activity in and around the target has been such that our ground operations have been exposed to continual harassment. It is my belief that today these enemy forces were struck a blow so severe as to render them ineffective for an appreciable period.

"A large number of NVA troops were observed actually running from the bombed zone following the first strike. They seemed oblivious to anything but putting distance between themselves and the oncoming bombs. Consequently, all were travelling in the same direction and at the same speed presenting a very tight, compact target. Observers witnessed one bomb of the second strike score a direct hit on the group which, needless to relate, utterly disappeared."

Enemy Counter Air Activities

As previously mentioned, the enemy made provisions for an active AA defense of key areas around Khe Sanh. 7AF Intelligence officials reported that in scope and firepower they were totally inadequate. Almost all were automatic weapons or small arms. The largest caliber AA threat against tactical aircraft proved to be the 37mm AA gun, frequently reported but never clearly photographed during NIAGARA. Every identified 37mm site was struck until its destruction or abandonment could be confirmed by photography. Smaller AA/AW positions were attacked visually whenever they posed a threat to the air mission. Over 300 gun positions were reported destroyed (by either aircrew observation or photo BDA) out of more than 600 struck during NIAGARA. ^{157/}

~~SECRET~~

~~SECRET~~

Extensive steps were taken to suppress ground fire in the approach and egress lanes to the Khe Sanh airstrip. The ground track of aircraft arriving and departing Khe Sanh was plotted from the point where an incoming flight would penetrate 3500' AGL to the point where outbound aircraft would regain that altitude. From that center line a lateral offset was made equivalent to the slant range of the 37-mm AA weapon against the flight path. This established approach and withdrawal lanes within which the active flak suppression operation was conducted. Transports entered, normally from the east. FAC aircraft flew off either wing-tip to spot AA positions and direct strikes, with escort fighters in trail. All signs of AA fire -- flashes or puffs of smoke -- were immediately engaged. As an additional aid, other fighters laid smoke parallel to the runway center line along the approach and departure routes. 158/

The flak suppression effort was extensive and ultimately effective. Although roughly two-thirds of the tonnage delivered during NIAGARA was air-dropped, landings were made at Khe Sanh on all but eight of the 70 days of the operation. All in all, 56 aircraft were hit and three downed representing 0.2 per cent of the total sorties flown. An additional C-123 was destroyed on the ground. 159/

Against the B-52s, the enemy could protect himself as he had through the years along the Ho Chi Minh Trail by concealment, dispersal and constant movement. However, his concentration on a point objective

~~SECRET~~

~~CONFIDENTIAL~~

limited movement and dispersal, and the intensive NIAGARA targeting effort destroyed his concealment. A credible SAM threat in NIAGARA might have inhibited ARC LIGHT operations, but there is no evidence the enemy attempted to introduce one. Ten days prior to NIAGARA, he fired four SAMs at a formation of B-52s over the central DMZ (YD087844-1702N/10655E), and intelligence carried a SAM threat in this general area throughout the NIAGARA period, but no more firings were observed until 25 May, almost two months after NIAGARA ended. ^{160/}

Tactical Airlift at Khe Sanh

From the time the decision was made to hold Khe Sanh, its tenability became almost solely dependent upon airpower. This was true, whether the enemy really looked upon the besieged base camp as a major objective, or whether they merely considered it a point of diversion for other alternatives. The primary defense of Khe Sanh was the sustained tactical strike and B-52 effort -- without which the base could well have fallen.

The 6,000-man U.S. Marine and ARVN force at Khe Sanh was equally dependent upon airlift for its tenability. With the enemy occupying the high ground around it, and its ground supply routes severed, Khe Sanh would have become isolated had it not been for air resupply.

Although the III MAF had an organic airlift capability, it was not within their capability to assume a resupply role of the magnitude required at Khe Sanh. Thus, it became largely dependent upon the 834th Air Division to keep the base resupplied and to evacuate the wounded.

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

By the time the ground resupply routes had been reopened almost three months later, the 834th AD had delivered over 12,400 tons of supplies to the forces at Khe Sanh. Of this effort, 8,120 tons were delivered by airdrop, and 4,310 by air landing under extremely hazardous conditions. ^{161/}

Prior to mid-February, enemy bombardment at Khe Sanh had become so accurate and intense that all aircraft landing at the airstrip had become prime enemy targets. "We have let the NVA get so close that he can put .50-caliber fire on the center line one half mile from final," one pilot commented on 19 February. No sooner would aircraft land, than incoming mortar, rocket, and artillery fire would begin. A Covey FAC ^{162/} who often landed at Khe Sanh made the following observations:

"Enemy weaponry has been moved up now (mid-February) to the point where we are being bombarded by high-angle short distance trajectory, rather than low-angle long distance trajectory. For example, there is a hole just off the runway at Khe Sanh that is quite unlike those made during January. The ones on 21 January were long gouges with little depth. There is a hole up there today that is a real crater. That round went straight up and came straight down. We still land there, but we won't land when there is a C-123 or C-130 there because they are a magnet for this heavy bombardment."

In view of the extremely hazardous ground situation and monsoon weather conditions, 834th AD officials advised the III MAF that air drop methods would have to supplement ground offloadings if the required tonnages were to be delivered at Khe Sanh. Three air drop methods would be used: (1) Ground Proximity Extraction System (GPES), (2) Container

~~CONFIDENTIAL~~

~~SECRET~~

Delivery System (CDS), and (3) Low Altitude Parachute Extraction System (LAPES). Navigational techniques and problems associated with these air drops will be discussed under "Coordination and Control".^{163/}

At first, the Marines were reluctant to agree that air drops represented the optimum means of delivery under the existing conditions. There were certain drawbacks, from the ground point of view. For instance, there was not sufficient room within the defense perimeter, and drops had to be made outside the "secure" area. This required additional security measures, and presented potential problems in recovery. One report also said that the Marine commanders were concerned that a slackening off in aircraft landings would adversely affect troop morale.^{164/} Perhaps the opposite was the case, in view of the fact that a definite rise in enemy shelling occurred with aircraft landings.

Also, since the drop zone was outside the base perimeter, it was unguarded overnight, thus requiring sweep operations each morning to secure the area for drops. The drop zone also had to be cleared of supplies prior to withdrawal in the evening. This resulted in a compressed daily time period for resupply drops.^{165/} Although most drops were successful, another problem arose when some drops went astray and could not be recovered prior to nightfall. These had to be destroyed to prevent enemy capture.^{166/}

Recovery time by the Marines, of course, was directly proportionate to the location of the drop. Pallets located within the drop zone were quickly recovered. The Marines reported that the average time required to

~~SECRET~~

clear one drop was 45 minutes if all pallets were in the drop zone. Pallets outside the drop zone resulted in several additional hours for recovery. 167/

Although initially reluctant, the Marine commanders were soon convinced of the reliability of the 834th AD effort. A III MAF message to the 7AF Commander on 26 February said: 168/

"Accuracy of drops has shown daily improvement, attesting to professional competence of air crews, GCA personnel and mission planners. Every effort being made to increase drop zone recovery capability and protect values, in order to attain goal of 235 short tons daily. Progress hampered by enemy action and adverse weather."

By using the air drop modes, along with the navigational techniques discussed in the next section of this study, the 834th AD was able to keep Khe Sanh amply supplied under extremely adverse conditions. Mission Commander reports and other official documents revealed the following information which might enhance future planning of similar operations: 169/

- The 7AF Commander directed that fighter aircraft would escort all tactical airlift aircraft into Khe Sanh. Thus, air logistics operations received support from strike aircraft expending smoke, napalm, and diverse hard ordnance throughout the approach, ground-handling and take-off phases.
- C-130s and C-123s provided the major effort, with the C-130s being the prime deliverer. A few C-7A sorties were flown, but it was determined that the

~~SECRET~~

relatively small capacity of this aircraft was insufficient for the effort and risk involved, and its use was discontinued.

For coordination purposes, the Air Force sent 7-10 man airlift teams to Khe Sanh, for 10-14 days each. These teams controlled maintenance, offloading, onloading, and all supply aircraft in the area. They also marked the drop zones, coordinated deliveries, and served as back-up air traffic controllers with their own communications equipment.

Supply activities were limited to daylight hours, because night operations would present the enemy with too easily distinguishable targets. Also, the supply drop zone was much too vulnerable for night operations.

Aerial delivery did not completely eliminate the risks to aircraft. By monitoring ground to air transmissions, the enemy often discovered arrival times and were able to direct fire as aircraft began their runs.

Optimum airlift planning and response requires early determination of firm supply requirements in terms of tonnage by the ground commander. Firm requirements at Khe Sanh were not provided to 834th Air Division planners until two weeks after the airlift effort began.

Coordination and Control

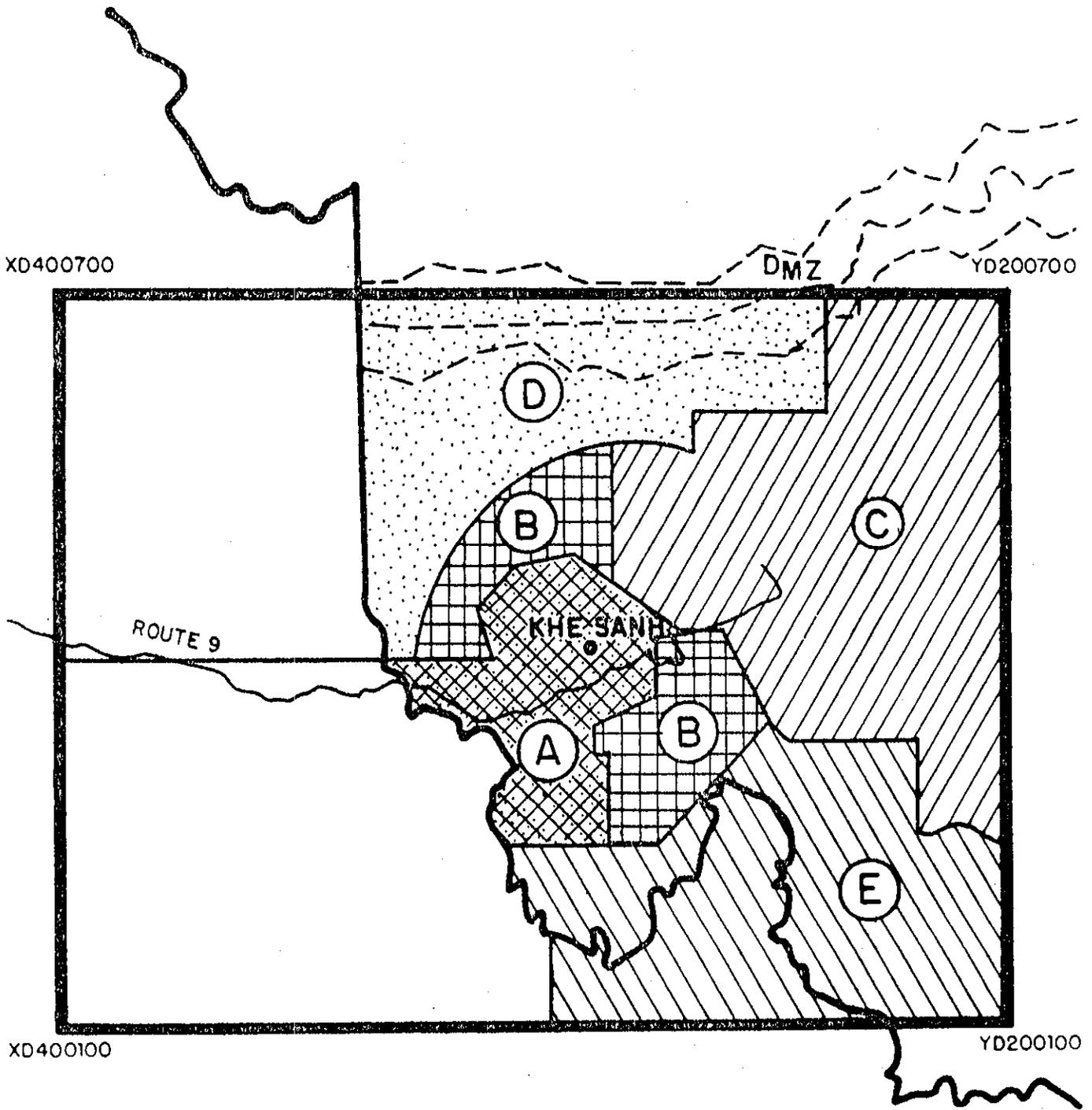
In the planning and execution phases of Operation NIAGARA, both COMUSMACV and the 7AF Commander stressed close coordination between participating forces and optimum control of weapon systems being employed. In view of the great amount and variety of air and ground weaponry being

~~SECRET~~

employed in this sustained operation, the basic elements of coordination and control required more attention than they would under ordinary operational circumstances. From the Air Commander's point of view, the objective was to provide optimum airpower within the boundaries established by the tactical situation and the resources available to him -- while assuring maximum conditions of safety and effectiveness for participating air forces. A major consideration, of course, was that this not be accomplished at the expense of other tactical situations which were developing throughout the theatre tactical zones.

The responsibility for optimum application of air resources in Operation NIAGARA rested clearly with the 7AF Commander, as directed by COMUSMACV. In accordance with COMUSMACV directive, the 7AF Commander, in his role as Deputy COMUSMACV for air operations, would "coordinate and direct the employment of the tactical air, Marine air, diverted air strikes from out of country air operations, and such Naval air that may be requested." B-52 operations were to be coordinated through him. One exception with regard to the control of tactical air was made. Although III MAF was directed to make available to 7AF all tactical strike sorties not required for direct air support of Marine units, III MAF was authorized to retain control of the effort in direct support of its own units. ^{170/} This exception left the matter of control of Marine air assets open to interpretation at the beginning of NIAGARA operations, with the end result being a negative impact on air planning and application of air resources in the area of concern during the first few weeks.

UNCLASSIFIED



UNCLASSIFIED

FIGURE 17

~~SECRET~~

III MAF's interpretation of command and control for NIAGARA air operations was reflected in a message to 7AF on 24 January. This message defined specific control and coordination zones which were meant "to ensure that the ground commander can employ all supporting arms in his area of responsibility and that air support assets are most effectively utilized." These zones were defined as follows: (Fig. 17)^{171/}

- . Zone Alpha: Restricted fire area coordinated and controlled by the Marine FSCC/DASC at Khe Sanh. Air support was required to be under positive control of FAC, MSQ, or TPQ.
- . Zone Bravo: A controlled area in which air strikes and artillery were coordinated by the Marine FSCC/DASC at Khe Sanh. DASC clearance was required for entry. Air strikes could be executed under flight leader control upon approval of FSCC/DASC Khe Sanh.
- . Zone Charlie: Restricted fire area coordinated and controlled by Marine FSCC/DASC at Dong Ha. Air support was required to be under positive control of FAC, MSQ, or TPQ.
- . Zone Delta and Echo: These were free strike zones. Military targets could be struck as required under flight leader control. CG I Corps granted blanket clearance for strikes of military targets in these areas. There were no known friendly forces operating therein. Air strikes in these zones were under control of 7AF ABCCC. FSCC/DASC Clearance not required.

III MAF further advised that Marine air strike sorties would be conducted primarily in Zones A and B, which were to be controlled by the Marine control agencies at Khe Sanh.^{172/} This implied that III MAF would concentrate its total air effort -- including reconnaissance, FAC, strike

~~SECRET~~

and targeting -- in one area under its own control. Furthermore, it implied that 7AF could apply its major effort around the III MAF effort, while of course contributing sorties as required in the areas under Marine control. By applying its total effort in one area considered to be "in direct support of its own unit," III MAF's actions were not in consonance with the spirit and intent of the COMUSMACV directive that the 7AF Commander would "coordinate and direct the employment of the tactical air, Marine air, diverted air strikes from out of country air operations, and such Naval air that may be requested." Moreover, it created a confusing control situation whereby airspace congestion and non-availability of aircraft became a common occurrence. Not only did cycling of sorties become a problem, but the planning cycle for target assignments and ordnance selection was severely weakened. ^{173/}

Most of the coordination and control problems encountered in NIAGARA during the first few weeks were directly attributable to the fragmented control arrangements involved in the management of the air program. Thus, this experience brought sharply into focus the long standing requirement for a single manager of tactical air assets in Vietnam. This does not imply that all problems in coordination and control would be immediately resolved by the establishment of centralized control under a single manager. It does mean, however, that coordination between participating forces could be accomplished more smoothly and effectively, and the optimum cycle of air planning and application of resources could be realized. ^{174/}

~~SECRET~~

The sustained weight of effort required in Operation NIAGARA could not be upheld by air resources organic to III MAF. This included both the operations and intelligence capabilities required for successful air application. It was not a question of mere augmentation of III MAF air resources to be applied at the discretion of the III MAF Commander. For an undertaking of this magnitude, the III MAF command and control system could not have effectively absorbed the full input of necessary operations and intelligence assets. Optimum management of the program could be applied only by COMUSMACV through his Deputy Commander for Air and the 7AF TACS which was both doctrinally and functionally designed to manage the total air effort.^{175/}

COMUSMACV's Deputy Commander for Air -- the 7AF Commander -- had the staff expertise and control system that was required to effectively manage NIAGARA operations. The 7AF TACS was designed to provide the real-time interface between intelligence and operations in the scope required for NIAGARA. Around the clock daily management could assure optimum cycling of sorties into the area of concern -- to include cohesive targeting, tactical response, and traffic control.^{176/}

Absence of centralized control at the beginning of NIAGARA created a situation whereby two separate air forces were conducting independent air operations in a compressed area of concern. This situation was compounded by the input of a large number of Navy tactical sorties and B-52 sorties into the same area. Problems of coordination between air

~~SECRET~~

and artillery were very small in comparison to those involving the different air elements. 7AF had liaison teams collocated with the Marine control agencies at Dong Ha and Khe Sanh to coordinate air matters, and all participating forces had mutual liaison at headquarters' levels. These efforts at coordination, while required, in no way compensated for the lack of centralized management of the tactical air effort. 177/

As previously mentioned, the lack of centralized planning for the total effort resulted in the inadequate cycling of aircraft. ABCCC mission reports continually emphasized that there were certain periods of air congestion, while FACs continued to report many instances when "no strike aircraft were available" to strike perishable targets. There was an obvious impact on ordnance planning. Ordnance was frequently reported incompatible to targets and terrain being struck. Other factors such as diversions and ordnance requirements for radar-directed strikes also had an impact on this problem; however, much of the inadequacy could be attributed to the lack of centralized management. 178/

Some specific problems reported by 7AF FACs, who were contributing by far the greatest FAC capability in NIAGARA, and the ABCCC were as follows: 179/

ABCCC was not kept informed on the amount of air activity in the "Alpha" and "Bravo" sectors of NIAGARA -- to include FACs. This contributed to a distorted picture of the overall air situation.

~~SECRET~~

- There were isolated instances in which Marine aircraft struck targets outside the "Alpha" and "Bravo" areas without ABCCC knowledge or coordination.
- There were also instances when ARC LIGHT strikes and TPQ and MSQ strikes were made without ABCCC and FAC knowledge. This created a hazardous situation for the FACs who often found themselves flying in the areas where these strikes were being conducted.
- FACs also reported isolated instances of transport aircraft flying through areas where they were directing air strikes in the "Alpha" and "Bravo" zones.
- Two targeting systems in the area created confusion. Frequently one control agency was hindered in assisting the other control agency in conducting strikes against lucrative targets because it was involved with its own targets.
- Further, the application of two targeting systems could conceivably result in a duplication of the strike effort, while allowing the status of other targets to remain active.
- In one instance on 10 February, the Marine control agency would not give the ABCCC strike clearance in the NIAGARA "Charlie" area until the source of target information was provided. The source was required so the Marine control agency could determine its validity and authenticity.
- Although the ABCCC and the Marine TPQ attempted close coordination, there were times that the TPQ was saturated with Marine flights and could not accept Air Force flights for radar control. Some of these flights had to depart the area without expending their ordnance because of bingo fuel.

To improve the command and control situation in NIAGARA, COMUSMACV gave the 7AF Commander full responsibility for the overall air effort for the defense of Khe Sanh. Accordingly, the 7AF Commander advised the CG III MAF and other participants on 13 February that the ABCCC would

~~SECRET~~

~~SECRET~~

assume the immediate coordination and handling of the air effort associated with the Khe Sanh area of operations. He advised participants: ^{180/}

"Specific instructions and procedures for targets and TOTs will be contained in the daily frag order issued by the 7AF TACC. To achieve success it is expected that the following forces will be committed to this effort: 7AF - 150 sorties; CTF-77 (carrier task force) - 100 sorties; III MAF - 100 sorties; and, SAC ARC LIGHT - 48 sorties. In addition to these strike aircraft there will be numerous FAC aircraft, airlift aircraft, and helicopters operating in the immediate vicinity and/or landing at Khe Sanh. In consideration of effective traffic control and mission accomplishment it is essential that efficient control be established and adhered to by all participants. Targeting and timing details for all aircraft including USN and USMC will be covered in 7AF TACC daily frags.

Procedures: All strike, FAC, support and airlift forces will contact ABCCC prior to entering the area of operations for confirmation of the primary mission and for hand off to the appropriate control agency. Exception: Helicopters operating in the Khe Sanh area will effect safe separation from other traffic and artillery in accordance with existing procedures.

ABCCC will effect direct coordination and control of operations within presently defined NIAGARA area..."

Many of the same coordination and control problems continued to hinder the NIAGARA effort over the next few days. This was primarily the result of delays in the effective integration of Marine air resources into the TACS. CG III MAF took the position that Marine air would adhere to the established control procedures until "modified as a result of concurrence between CG III MAF and Cdr 7AF". ^{181/} In the meanwhile, the ABCCC reported: ^{182/}

~~SECRET~~

~~SECRET~~

- 14 Feb: Marine flights did not check in with Hillsboro ABCCC but worked with Carstairs II (Marine control at Khe Sanh). ARC LIGHTs did not check in. Only fragged information was available. TPQ saturation and target area congestion forced diversion of some aircraft but most fragged targets were struck at some time during the period.
- 15 Feb: Marine aircraft were not checking in with Moonbeam (night) ABCCC and were going directly to Carstairs control. Resulting congestion required stacking over Channel 85. For approximately one hour Carstairs did not put aircraft on targets requested by Moonbeam.
- 16 Feb: Hillsboro reported that continuous ARC LIGHT missions prevented MSQs from directing Sky-spot strikes the entire time on station. This denial of MSQ-77 facilities (one was out of commission) restricted the ABCCC capability to strike NIAGARA targets and had it not been for the visual capability in western NIAGARA at least a dozen sorties would have had to return to base with their ordnance.
- 17 Feb: ABCCC had no prior knowledge of ARC LIGHT strikes after midnight which caused a confusion factor when the controlling agency requested target confirmation.
- 17 Feb: Marine flights still not checking in with ABCCC although AF strikes were applied to Carstairs targets for approximately two hours when he had troops in contact and declared an emergency condition.
- 18 Feb: Hillsboro controlled AF, Navy and airlift traffic. Marine flights did not check in with Hillsboro, but went direct to Carstairs II.
- 19 Feb: Moonbeam reported several unsuccessful strike aircraft due to MSQ sites supporting Arc Lights and the Marine TPQ site down due to maintenance.
- 21 Feb: AF strikes were provided to Carstairs II for lucrative targets in the Khe Sanh area. When arriving on station, ABCCC was advised by Carstairs II that it would not be able to accept AF targets since the TPQ was needed to support resupply missions.

~~SECRET~~

~~SECRET~~

The daily control and coordination problems experienced by the ABCCC continued to reflect the same pattern. ABCCC Commanders strongly recommended that if the ABCCC was to be the prime control for all strikes in the NIAGARA area, the Marine strikes should check in with them prior to working targets. This would facilitate a smoother flow of strike traffic in the area and allow for more efficient control. ^{183/}

Another recommendation: ^{184/}

"Immediate steps must be taken to review the requirements for MSQ-77 sites to devote their entire efforts toward ARC LIGHT missions. The concept is completely unrealistic for the loss of Carstairs Bravo would have brought all air strikes in the NIAGARA area to a complete standstill except for one ARC LIGHT approximately every 90 minutes. If MSQ-77 sites cannot be made more available for tactical air strikes, then the tactical air sortie rate must be reduced."

Later, in early March, many of the coordination and control problems were resolved through integrated planning and a more centrally controlled air effort. Integrated frag teams were established, and the planning and operational cycle for air application became more responsive to tactical requirements. However, many tributaries of control appeared to remain clogged with functional confusion. This was obviously the result of having to make continuing adjustments in the command and control system throughout the execution phase of an air operation, especially one of the force magnitude and time frame constituted by Operation NIAGARA. Of course, under any management concept, operational procedures are continuously reviewed for possible improvement; however, had single management

~~SECRET~~

~~SECRET~~

of air assets in Operation NIAGARA been clearly established prior to the execution phase, most potential problems could have been resolved during the operational planning.

A final discussion of control experience in NIAGARA concerns tactical airlift at Khe Sanh. Inclement weather conditions and the hazardous terrain around Khe Sanh required special procedures for all weather delivery of supplies to the besieged Marines. Aircraft supplying Khe Sanh during weather conditions were handed off from Hue Control to the GCA unit at Khe Sanh which was used to guide aircraft to a predetermined point at the approach end of the runway. At that point, because the aircraft came too near to the GCA location for precise direction, a system involving radar reflectors on the runway, the aircraft doppler system, and stopwatch timing was used to guide the aircraft to the proper release point. When the GCA unit was malfunctioning, or when it was knocked out by enemy fire, the Marine TPQ-10 at Khe Sanh supplemented operations. ^{185/}

Operations Summary

The tactical situation in the NIAGARA area during the month of March was characterized by a continuing high level of enemy activity around Khe Sanh. Incoming artillery, rocket and mortar rounds at Khe Sanh in March were of a greater number than in February. 5,181 rounds of mixed ordnance impacted on the base in March, while 4,710 rounds were received in February. Friendly forces at Khe Sanh suffered 45 KIA and 195 WIA (evacuated)

~~SECRET~~

in March. In February, they suffered 48 KIA and 205 WIA (evacuated). ^{186/}

Enemy trenchwork around Khe Sanh also continued to expand during March. In one report on the trenches in mid-March, Nail FAC 62 observed:

"Trenches from the south are close to the perimeter; many are within 200 meters of the outer fence, and a few go right up to the outer fence. There are now fresh trenches perpendicular to the approach trench forming a 'T' (parallel to the runway). Many foxholes and bunkers are located to the north. South perimeter is covered by trenches and tunnels; foxholes can be seen within the trenches suggesting the presence of personnel on a full time basis."

Some of the heaviest action at Khe Sanh in March began on the night of the 22nd. Intelligence officials later estimated that the enemy had planned to stage a major assault against Khe Sanh on 22-23 March. Nail 35 who flew in the Khe Sanh area during the daylight hours of 22 March reported "working several flights within 400 meters of the Khe Sanh perimeter." Each bomb that hit a trench produced several secondaries which were believed to be rockets. The FAC also noted "small holes", which he said were not foxholes. These were about 200 feet from the perimeter and dug at an angle so the bottom could only be seen from the west, i.e. over the strip. Nail 35 suggested these might be mortar positions. He also reported no personnel to be seen anywhere near the area and the complete absence of ground fire appeared to confirm this. ^{188/}

At 1900 hours on the 22nd, Khe Sanh began receiving heavy incoming

~~SECRET~~

fire. The volume slacked off for a short period, and then increased in tempo at 2045 hours. III MAF considered this to be a possible pre-assault barrage, and the III MAF Commander passed the following request to 7AF. "Khe Sanh receiving heavy incoming. Request 7th AF be aware of possibility of request for tactical air support at Khe Sanh." By 2400 hours of the 22nd, Khe Sanh had been subjected to a barrage which included 300 artillery rounds, 92 rockets, and 250 mortar rounds -- a total of 642 rounds. Six personnel were killed, and 28 wounded. One ammunition bunker was destroyed, and several artillery pieces were damaged. On the following day, Khe Sanh received another barrage of 636 rounds of mixed ordnance. Thirty-nine friendly personnel were wounded in action, with 17 evacuated.^{189/}

Tactical air responded with 1,074 sorties between 22 - 24 March in the defense of Khe Sanh, with the largest number being flown on the 23rd -- 438 sorties. The B-52s totalled 138 sorties into the area over the three day period, with 51 of these being flown on 23 March. If an enemy attack was planned, it did not materialize, and the enemy shelling dropped off.^{190/} The ABCCC reported that on the night of 22 March, Carstairs II had requested specifically that the AC-130 weapon system (Spector 05) be provided for suppression of enemy fire. This request was made at 2200 hours during the heaviest period of enemy shelling. Moonbeam was unable to comply because of AC-130 crew rest, and a Spooky AC-47 was provided instead. No additional air was requested by Carstairs II, and afterward the area was relatively quiet. Moonbeam recommended:

~~SECRET~~

"Spector 05 remains the most effective weapons system against ground troops and movers. Recommend that more of this type aircraft be provided to the theater." 191/

The stream of tactical air sorties flown in NIAGARA during March remained constant at a daily average of 301. The daily average for the sustained operation between 22 January and 31 March was 300. B-52 sorties increased considerably during March with a daily average of 41, as compared to a daily average of 33 during the first 38 days of NIAGARA operations. Bomb Damage Assessment (BDA) for tactical air showed increased results in March. For instance, there was a daily average of 87 secondary explosions and fires reported in March, compared to a daily average of 65 prior to March. In this comparison, the weather factor must be considered. Although weather was still bad in March, more visual sightings could be made and more visual BDA obtained. 192/

NIAGARA operations ended on 31 March, with a total of 24,449 tactical air and B-52 sorties having made strikes against the enemy. An additional 1,598 FAC sorties and 1,398 Reconnaissance sorties were flown. Over 100,000 tons of bombs were dropped in the NIAGARA area, and over 100,000 rounds of artillery and mortar ammunition were also fired in support of the combat base at Khe Sanh. 193/ Combat Sky Spot permitted the campaign to proceed without interruption by darkness and bad weather; 62 per cent of NIAGARA air strikes were conducted under Sky Spot control.

~~SECRET~~

Weather precluded accurate BDA of the air effort. Cumulative BDA reported for tactical air strikes in this study was derived from visual sightings and is obviously deflated. FACs had an extremely difficult time making strike assessments because of weather conditions, and post-strike BDA of Sky Spot strikes was negligible. Also, even under good weather conditions, definite BDA was often precluded by smoke, dust and dense foliage. Cumulative BDA gained from visual sightings was reported as follows for tactical air strikes: 4,705 secondary explosions and 1,935 secondary fires; 1,288 KBA; 253 trucks destroyed and 52 damaged; 300 gun positions destroyed and 43 damaged; 891 bunkers destroyed and 99 damaged; 1,061 structures destroyed and 158 damaged; and, nine tanks destroyed and four damaged.^{194/}

BDA information on B-52 strikes was also limited. Weather also restricted aerial observation of targets struck by the B-52s. When reconnaissance was possible, much of the damage observed could not be specifically attributed to B-52s because of numerous tactical air strikes and artillery fire in the area. A preliminary MACV study reported the following total number of destroyed/damaged B-52 targets in the Khe Sanh area for the period 15 January to 31 March obtained by visual and photo reconnaissance:^{195/}

- .. Defensive Positions: 274 destroyed and 67 damaged.
- .. Weapons Positions: 17 destroyed and 8 damaged.
- .. Lines of Communication: 23 destroyed and 34 damaged.

~~SECRET~~

~~SECRET~~

In addition, SAC aircrews reported approximately 1,362 secondary explosions and 108 secondary fires in the target areas. MACV interpreted: ^{196/}

"It is evident from the above figures that B-52 strikes have destroyed numerous enemy offensive/defensive positions and disrupted supply and storage areas. Other evidence shows that the enemy has also suffered many casualties to these attacks. Photo reconnaissance of an area near Cam Lo revealed twelve enemy bodies which can be directly attributed to B-52s. According to POW, rallier, and refugee reports, elements of the 304th Division have sustained heavy losses. The attacks were often a surprise to enemy units, and reportedly caused, in addition to KIA, numerous concussion type injuries which required evacuation. An entry in a notebook captured at Khe Sanh reads in part: 'From the beginning until the 60th day (the 60th day of the siege at Khe Sanh) B-52 bombers continually dropped their bombs in this area with ever growing intensity and at any moment of the day. If someone came to visit this place, he might say that this was a storm of bombs and ammunition which eradicated all living creatures and vegetation whatsoever, even those located in caves or in deep underground shelters'.

"Desertions apparently resulted from strikes. Reportedly, individuals often took advantage of the confusion immediately after a strike to leave their units. An extract from a captured document, dated 29 Feb 68, states that contingents of Dcan 926 suffered 300 desertions while enroute to Khe Sanh. Fear of enemy B-52 raids was given as the main cause for these desertions. The shock, confusion, and destruction brought by B-52s contributed to lowering the morale of the enemy. In one instance, a source said that nearly seventy percent of his unit's rice supply was destroyed by B-52 bombs, causing frustration and hunger. Another source stated that his men were afraid of the strikes because of the supposed high casualties inflicted on the 1st (9th Regt 304 Div).

~~SECRET~~

~~SECRET~~

To lessen the fears of their troops, the NVA undertook a concerted propaganda effort, telling the men not to fear B-52 strikes because bombs had to fall within 3 meters to cause a casualty. Breu refugees were told that they should not fear B-52s, with implications that the NVA had an anti-B-52 device in the Khe Sanh area."

MACV advised on 20 April that although an accurate and comprehensive estimate of the extent of destruction could not be made at this time, it was almost certain that enemy losses, both personnel and equipment, greatly exceeded those reported.^{197/} With data available at the time this study was prepared, an accurate quantitative analysis of the impact of airpower on enemy forces and plans in the NIAGARA area could not be made. Several agencies were engaged in a continuing comprehensive collection and study of pertinent NIAGARA data, and indications were that a final analysis was a long way off. In the final analysis of the impact of airpower in the defense of Khe Sanh, the full scope of the air role must be considered. For instance, the effectiveness of air delivered gravel (anti-personnel mines) on enemy withdrawal routes must be considered. Also, an assessment of 7AF's total interdiction effort during this period and its impact on the Khe Sanh tactical situation would be an essential analytical study ingredient.

Conversely, there would appear to be a need to address the question of what impact a sustained air program of NIAGARA's magnitude might have on the functional response of the 7AF TACS to theatre-wide requirements -- both immediate and long range. This might be correlated with a study to detect any pattern of enemy reaction to predetermined patterns of

~~SECRET~~

~~SECRET~~

airpower response in special air programs such as Operations NEUTRALIZE and NIAGARA whereby the Air Commander is required to concentrate a major portion of his air effort in one area to preserve the posture of a friendly ground force. In other words, once the tactical situation at Khe Sanh reached the point that a sustained SLAM-type effort was required to provide primary defense, there was no question of the validity of the sustained requirement nor that the commitment would be honored. However, it is logical to assume that the enemy's choice of alternatives could allow him to plan for and take advantage of a situation such as the one created at Khe Sanh.

While stepping up infiltration into I Corps during the early part of NIAGARA operations, the enemy had also accelerated troop and supply movement through Laotian infiltration routes into the lower provinces of South Vietnam. Also, NVN and Pathet Lao hostilities against Royal Laotian forces and friendly Laotian villages and cities were on the rise -- especially along the eastern periphery of the NVN infiltration routes. It appeared that NVN strategy in this was not only to move friendly Laotian observers out of the area, but to widen his avenues of infiltration -- not only from Laos into South Vietnam, but through the highly motorable valley floors of Cambodia, for offensives in the lower Corps areas. Throughout NIAGARA, intelligence officials closely followed the enemy's reinforcement of his posture in the A Shau Valley, which was the target for Allied operations subsequent to NIAGARA. Enemy reaction had been much the same in the last part of 1967. While attention was focused on Operation NEUTRALIZE, they had begun moving their forces south for the Tet Offensive, which included Khe Sanh.

~~SECRET~~

~~SECRET~~

There has been much speculation about the enemy's real intentions in the Khe Sanh area. One position has been that Khe Sanh was a diversion for the Tet Offensive. An opposite estimate is that the widespread Tet Offensive was an attempt to dilute airpower availability in support of Khe Sanh. This was not accomplished; however, there was an impact on all out-of-country operations, except those considered to be essential. A MACV post-analysis concluded that all evidence indicated "conclusively" that the enemy had planned "a massive ground attack against the combat base supported by armor and artillery". The analysis stated that the enemy's initial target date apparently coincided with the Tet Offensive. Subsequent target dates estimated by MACV were: ^{198/}

- . The last week in February. The enemy's heaviest attacks by fire at Khe Sanh occurred during the period 21-25 February.
- . 13-14 March and 22-23 March. These dates were obtained through intelligence sources.

It is possible that Khe Sanh was just one of a few important objectives in an overall enemy attempt to win both a military and political victory, the difference being that its location made it more vulnerable than other targets. Whether it was a major or minor target, the fact remains that Khe Sanh was effectively pinned down and could have been overrun under the existing circumstances had it not been for airpower. If the enemy planned to launch a major assault against Khe Sanh, it is likely that NIAGARA Operations completely disrupted his timetable. A

~~SECRET~~