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Chapter IV

THE AIR PRESSURE CAMPAIGN

"Our side absolutely cannot consider under whatever circumstances any proposal of the so-called no-forced repatriation which would detain war prisoners," stated Communist chief negotiator Nam Il at the Panmunjon truce conference on 12 September 1952. Nam Il continued: "No matter what your side should do inside or outside of the conference, the Korean People's Army and the Chinese People's Volunteers will fight to the very end for the return of every single war prisoner."¹ At the United Nations on 10 November 1952, Soviet Foreign Minister A. Y. Vishinsky told the General Assembly's Political and Security Committee that Russia would "never budge" from its opposition to voluntary repatriation of Korean prisoners of war.² Just as adamant were statements by United Nations spokesmen that the UNC would never agree to forcible repatriation. "Our position," the chief UNC delegate stated at Panmunjon on 8 May 1952, "is one from which we cannot and shall not retreat." In a letter made public on 20 August 1952, President Truman stated that Red POW's who would "rather die than live under communism again" would not be forced to "return to their enslaved homeland" and face "almost certain death."³ In a speech in London on 10 November 1952, British Prime Minister Winston Churchill said that he would not "purchase peace at the price of dishonor" by sending "helpless prisoners of war back by force to be massacred by a Chinese Communist Government that boasts that it has actually rid itself of two millions of its own people."⁴

When it was evident that the Communists would not accept the principle of voluntary repatriation of prisoners of war, the U. S. Joint Chiefs of Staff had directed the CINCUNC to apply and maintain against the Communists the maximum military pressure within the capability of his

means and which could be justified by results. After less than a year of such pressure the Communists capitulated, and on 8 June 1953 the same General Nam Il, who had arrogantly boasted that the Communists would fight to the very end rather than to accept voluntary repatriation, signed the terms of reference for the Neutral Nations Repatriation Commission which decreed that POW's who did not want to go back to Communism would be freed as civilians after 120 days if a major political conference failed to solve their problem.⁵ This complete capitulation on the part of the Communists resolved the last and bitterest issue of the truce negotiations, and on 27 July 1953 the signing of the final military armistice instrument terminated hostilities in Korea.

The United Nations obtained its objectives in Korea by the maintenance of a firm and unwavering line of diplomatic policy which refused compromise at the same time that its forces laid intense military pressure against the Communist armies in North Korea. This "military" pressure, moreover, was solely the crushing impact of American air power, brilliantly aimed against targets of military import in a manner calculated to make the continuance of hostilities as costly as possible to the Soviet bloc of nations. "The capability for . . . [maximum military] pressure, without unacceptable cost," General Clark informed the JCS on 27 August 1952, "lies in the air arm."⁶ After October 1952 UNC ground forces in Korea undertook no offensive action, and UNC air attacks comprised not only the predominant but the only military pressure placed upon the enemy.⁷ During the last year of Korean hostilities, American air power executed the dominant role in the achievement of the military objectives of the United States and of the United Nations.

In the achievement of these national military

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objectives, FEAF leaders had to pioneer beyond World War II concepts of tactical and strategic air operations. As it was developed through trial and experiment, the air pressure strategy would comprise two planes of air actions. Sustained air attacks would be prosecuted from day to day against such target systems as would make the war as costly as possible to the enemy in terms of equipment, supplies, facilities, and personnel. Quite soon, however, General Weyland would perceive that he could superimpose upon these sustained

air attacks another plane of air actions, attained through concentrations of force at decisive times and places designed to affect the thinking and actions of Communist bloc nations. The story of the air operations of the air pressure strategy is thus in fact two parallel stories: the narrative of the air attacks which effected cumulative destruction upon the enemy and the narrative of the manner in which the timing, intensity, and locale of air attacks were regulated in order to effect psychological changes in the ranks of the enemy.

EXPANDING THE AIR TARGETS HORIZON

The Problem of Targets: Up until the middle of 1952, USAF doctrines had been generally concerned with "strategic" and "tactical" air operations, and it was not entirely easy for many of the FEAF leaders to tear themselves away from the incubus of history and to pioneer in new doctrines which would utilize air power as an instrument of national policy. Viewed in terms of existing doctrine, an air pressure strategy appeared to require "strategic" target systems, which no longer existed in North Korea. In the initial months of Korean hostilities the FEAF Bomber Command, then mustering a strength of five medium bomber groups, had destroyed most of the North Korean industries which were capable of supporting the hostile war effort. Although the JCS had suspended further strategic bombing after 25 October 1950, the initial medium bomber target attack plans had been quite sound and few "lucrative" targets remained in North Korea.

Viewing the requirements for the selection of targets for an air pressure campaign, FEAF target experts were frankly pessimistic as to whether the result of such an attack program would be commensurate with its cost. On 28 August 1952, Brig. Gen. C. Y. Banfill, FEAF Deputy for Intelligence, pointed out several limitations which he anticipated in implementing the new attack program. A part of these limitations were geographical. The area northwest of the Chongchon River was suitable only for occasional attacks under the most favorable conditions. Reconnaissance aircraft could penetrate there only with expensive fighter escort, rendering target development in that area extremely difficult. The area north and east of Manpojin was beyond the radius of most Fifth Air Force aircraft, was too dan-

gerous for B-29 daytime attack, and lay so far outside of shoran range as to prevent B-29 night attacks. There were also operational limitations. Bad weather limited the attack capability of the Fifth Air Force, and good weather restricted Bomber Command attacks against those targets which had searchlight defenses. Heavy anti-aircraft artillery concentrations in sensitive areas would keep UNC aircraft at high altitudes. Finally, enemy countermeasures promised to limit the program. The enemy was aware that he had a "safety zone" in the northwest and had moved industrial facilities into this area. He had moved many smaller targets such as munitions and clothing factories to underground locations. General Banfill concluded that: "Fifth Air Force and BOMCOM's earlier work, coupled with the recent destruction of the enemy's power system, has left Korea almost devoid of targets that are suitable in a strategic or economic sense."⁸

In terms of historical operations and established concepts of target selection there were in fact very few "lucrative" targets in North Korea, but when intensive target analysis was put to work on the problem it turned up a good many worthwhile targets. Some of these targets had been overlooked in the initial strategic target attack plans of 1950, some of them had recuperated from earlier bombings, and some new targets were discovered which might have escaped notice had they not been closely scrutinized in the light of an air pressure strategy. This whole experience led Brig. Gen. Don Z. Zimmerman, successor in the duties as FEAF Deputy for Intelligence, to point out a lesson that: "A dynamic and constant expansion of the target horizon . . . will always reveal that efficient employment of air power can be made

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regardless of the circumstances of the operation, the geographical location, the composition, deployment, and tactics of the enemy forces. It is the mission of the targets people to research and reveal the most effective ways of employing all our combat air strength."⁹

Development of Air Pressure Targets: During the year prior to July 1952, in which time FEAF aircraft had engaged in attacks against North Korean railways, targets had been fairly obvious and easy to identify since they were generally bridges, rail tracks, and such airfields as the Reds tried to rehabilitate. The FEAF operational policy directive of 10 July 1952, however, posed the need for a wide variety of targets in some 17 priority categories.* It was planned that the selection of individual targets for destruction was to be made with a consideration to the relative listings by priority, to the vulnerability of the particular target to air attack, and to the economy of air effort involved in a particular attack. The possibility of developing lucrative air targets when none otherwise existed was to be exploited: thus attacks against the enemy rail system would simultaneously assure that this system was not rebuilt to such an extent as to sustain an effective enemy ground offensive and would also develop concentrations of locomotives and rolling-stock for profitable follow-up attack.¹⁰

As the subordinate FEAF commands got to work selecting and nominating targets under the new operational policy directive, it was evident that the Fifth Air Force would not have much difficulty in finding the targets which it required. Located in Seoul at the forward echelon of Fifth Air Force headquarters, Air Targets Division, Directorate of Intelligence, was already a small assembly plant for the production of targets. The Air Targets Division was immediately regeared on a production line basis to collate and confirm target intelligence with photography, but there was still a need for the development of targets through photographic interpretation of the voluminous quantities of photo cover taken daily by the 67th Tactical Reconnaissance Wing. A targets section was therefore established within the 67th Reconnaissance Technical Squadron, and the findings of this activity were issued in the form of target special reports. The Fifth Air Force

*See Chap. II, p. 35.

also made heavy use of Detachment No. 2, 6004th Air Intelligence Service Squadron,† which, in fact, proved to be its most important single collector of tactical air intelligence. This detachment collected information from agents, prisoners of war, and refugees, submitting between 600 and 900 air intelligence information reports to Fifth Air Force intelligence each month.¹¹ As was anticipated, the Fifth Air Force did not experience any great difficulty in finding targets for its aircraft: in early November 1952 that air force reported a backlog of 330 targets ready for attack, in addition to some 600 troop concentration targets. In the mill at that time were about 330 potential objectives, of which approximately one-third would prove suitable for air attack. Most of these targets were Communist headquarters, troop concentrations, supply dumps, and communications centers.¹²

Prior to July 1952 the Superfortress bombers of the FEAF Bomber Command had been concentrating their attacks against key enemy rail bridges, marshalling yards, and airfields, but the policy directive of 10 July required these bombers to attack communications centers, manufacturing facilities, supply concentrations, and other similar targets. Bomber Command now had a requirement for between 60 and 80 diversified shoran targets per month, a requirement which would be difficult to meet on two accounts.¹³ Possessing a manning authority for only 19 officers and 15 airmen, the Deputy for Intelligence, FEAF Bomber Command lacked sufficient personnel to handle any large day-to-day quantity of targets. Such was recognized, but, instead of providing the necessary wherewithal to Bomber Command to permit it to maintain a capability commensurate with its responsibilities, the FEAF Targets Directorate in July decided to "operate" and thus to augment Bomber Command's target selection agency in the research and preparation of target materials for individual B-29 targets.¹⁴ Although this action appeared necessary at the time to expedite the air pressure strategy, its results were said to be dis-

†The 6004th Air Intelligence Service Squadron had been organized by FEAF at Tokyo on 2 March 1951 and was then charged with the mission of collecting information which, when evaluated, might indicate the war-making capabilities and intentions of possible enemy nations. Three detachments of this squadron served under the operational control of the Fifth Air Force in Korea: No. 1: Air Technical Intelligence; No. 2: Tactical Air Intelligence Information and Special Intelligence; and No. 3: Evasion and Escape.

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appointing: almost all of the FEAF Korean Targets Analysis Division's effort was diverted from its primary duty of maturing over-all target recommendations and priorities while it made at best a slight contribution to Bomber Command in view of the large quantity of targets which that organization required.¹⁵ As the destruction operations progressed, the Fifth Air Force also turned over to the FEAF Bomber Command a good number of targets which were worth attacking but not suited for light bombers or fighter-bombers. Bomber Command's own targeting capability, moreover, was largely dependent upon the Fifth Air Force's 67th Reconnaissance Wing, whose reports furnished a continuous flow of information, either in the form of photo prints, from which photo interpretation studies were made at Bomber Command, or of completed reports and studies accomplished at Fifth Air Force. Another source of reconnaissance photography was the 91st Strategic Reconnaissance Squadron, which flew regular missions over east-central North Korea, and the 548th Reconnaissance Technical Squadron also provided medium bomber targets. There was no shortage of intelligence information, but Bomber Command's real difficulty lay in a shortage of personnel available for the intensive study required to locate and develop profitable medium bombardment targets.¹⁶ Viewing Bomber Command's continuing targeting troubles in retrospect, the FEAF Deputy for Intelligence drew the lesson that: "If a command, through some limitation or inadequacy, is unable to fulfil a required function, the higher headquarters, rather than attempt to assist in the actual production, should instead provide the command with the necessary wherewithal to maintain a capability commensurate with its responsibility."¹⁷

A second major problem involved in targeting for Bomber Command was the fact that all of its targets, because of inaccuracies in existing Korean maps, had to be especially processed for shoran attack. Two methods were known whereby mapping errors could be eliminated. One method employed shoran reconnaissance photography, flown by a plane equipped with an APA-54 shoran recorder, but this method would not prove practicable.* The other method was a multiplex stereoplotting process which in effect justified maps against aerial mapping photography. Before

*See Chap. VII, pp. 245-46.

July 1952 the 64th Engineer Base Topographical Battalion of the FEC had been providing the multiplexed coordinates which Bomber Command required, but its production capability was only about five sets of these coordinates a week.¹⁸ Until FEAF could expand this capability, Bomber Command did the best that it could with too few multiplexed coordinates. Medium bomber bombing accuracy was therefore deficient: in September 1952, when supply targets near Pyongyang were attacked, the bombers had good bomb patterns but their main points of impact were not uncommonly 1,000 feet away from the mapped aiming points.¹⁹ FEAF was working to expand its own multiplexing program: by August the 548th Reconnaissance Technical Squadron had assembled the necessary equipment at Yokota; early in September it sent men to engage in on-the-job training with the 64th Battalion; and by the end of the year all multiplex coordinates were being determined by the 548th Squadron.²⁰ In January 1953 this squadron could multiplex a maximum of 90 average-difficulty targets per month and could complete such coordinates on priority targets in three to four days.²¹ By May, the 548th was additionally able to provide 30 multiplexed coordinates per month to the Fifth Air Force, and in this same month the publication of a new multiplexed-compiled 1:25,000 scale set of maps of North Korea, which was considered accurate for determining shoran target coordinates, was progressing rapidly. These maps would eliminate the necessity for multiplexing individual targets.²²

Coordination of the FEAF Air Effort: With the single important exception that the UNC/FEC theater organization did not permit close integration of Seventh Fleet air capabilities in a routine day-to-day air effort, FEAF secured a maximum coordination of UNC air attack effort necessary to the economy of the air strategy in Korea. This coordination was the work of the FEAF Formal Target Committee.

Comprising representatives of the operations and intelligence functions of FEAF, the Fifth Air Force, and the FEAF Bomber Command, the FEAF Formal Target Committee met biweekly at Tokyo. Its usual agenda began with an intelligence briefing on such matters as the status of targets in North Korea, and then Bomber Command and Fifth Air Force representatives pre-

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sented statements of the general intent of their respective operations planned for the next two weeks. Constant attention was given to the elimination of competition for lucrative air targets. When necessary, a reverse from this procedure was followed: FEAF representatives outlined target systems of a desired line of air activity which was to be exploited and the other committee members took steps to implement the desired actions. After target committee recommendations were approved by General Weyland, they were distributed to the Fifth Air Force and Bomber Command for execution and to NAVFE for information.²³ Meeting of minds at these FEAF Formal Target Committee sessions insured that the fighter-bombers and the medium bombers alike received the targets which they could best handle and that targets developed as a result of a given attack would be followed up by other strikes. Old concepts that certain targets were "tactical" and others were "strategic" were abandoned, and, so far as FEAF resources were concerned, air power was undivided by artificial and unreal attempts to classify targets by types of aircraft.

Although FEAF intelligence agencies success-

fully targeted hostile objectives for pressure attacks and the FEAF Formal Target Committee insured an economy of effort, FEAF intelligence encountered one major problem which was never solved. Air intelligence could target physical objectives for attack and could calculate the physical damage done to an air target by an air strike, but it was not able to determine what significance a particular physical objective might have to the Communist regime nor could it project the effect of a given amount of destruction upon the hostile regime's primarily political decision to end the fighting. As General Zimmerman pointed out, land forces had always judged and portrayed their success by a line drawn on a map which showed the current position of the fighting front in relation to an enemy's territory, but the Air Force, which operated over the enemy's homeland, had no way of judging or portraying the effects of its decisive air attacks. There was need for new types of social and political intelligence. "Briefly stated," said Zimmerman, "the problem is to determine the effect of air action in war and then to present this effect in a simple, brief way so that it may be clearly understood and appraised."²⁴

LAUNCHING THE AIR PRESSURE OPERATIONS

Air Operations in their Political Context: Between 28 April 1952, when the UNC made its final package proposal looking toward the resolution of the points of difference in the truce negotiations, and 8 October 1952, when the UNC recessed further talks at Panmunjom until such time as the Communist delegates might have a constructive proposal, the main effort of the United Nations and the United States was to budge the Communists from their obstinate refusal to accept a principle of voluntary repatriation of prisoners of war. During the period, the UNC had made its decision to utilize air pressure against the Communists as a lever for speeding their acceptance of the UNC terms offered at Panmunjom. As a concomitant to this decision, an effort was also made to key air operations in the Far East to developments both in Korea and within the Communist bloc of nations.

Such intelligence as came from behind the "Bamboo Curtain" indicated that the Chinese probably genuinely wanted an armistice: one report to CINCUNC from a "highly sensitive

source" stated that on 28 June 1952 a conference between Soviet and Chinese diplomatic representatives was in session at Peking and was discussing the policy to be followed at Panmunjom.²⁵ During July the U. S. Department of State proposed that it might be well to seek the good offices of the Soviet Union for a settlement in Korea, but this proposition was laid aside in view of the strong objections of General Clark and of Ambassador George F. Kennan, the latter being the U. S. diplomatic representative in Moscow.²⁶

Again in August 1952 there were evidences of some sort of troubles in the Sino-Soviet bloc, and on 17 August the Chinese Premier Chou En-lai arrived in Moscow for top-level talks. Although few pronouncements were forthcoming regarding the mission of the Chinese Communist delegation, the indications were that among subjects to be discussed would be the Sino-Soviet Treaty of 1950, military and economic aid for China, and Communist policy toward Korea.²⁷ From Moscow, Ambassador Kennan stated that he believed the Chou visit presented an excellent opportunity to

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obtain an armistice in Korea. He particularly proposed that anything the UNC could do at the time "to frighten" the Chinese and to increase their supply demands on the USSR would be all to the good. Desirably, such a military threat should be accompanied by some sort of conciliatory gesture which would indicate to the Soviets that it would not be hard to move toward a cease-fire. The USSR would thus have an easy alternative to accepting the Chinese demands.²⁸ On 19 August, a few days before the Kennan proposal reached CINCUNC, FEAF planners had been discussing possible measures for increasing air pressure on the enemy during the Moscow conference, and on 21 August General Smart directed the Fifth Air Force and FEAF Bomber Command to increase the tempo of their air attacks and desirably to attack targets in the far northwest area, such as Sui-ho, Sinuiju, the Namsan-ni Chemical Plant, and thus make a display of air power. Both Generals Clark and Weyland thought that at this juncture Pyongyang military targets could again be profitably attacked.²⁹ General Weyland also pointed out to CINCUNC that facilities at Kadena Air Force Base on Okinawa could accommodate a squadron of B-36 heavy bombers, and General Clark urged the JCS to dispatch such a squadron on a routine training operation which would produce a strong psychological effect on the Korean armistice negotiations. On 4 September, however, the JCS advised that operational considerations precluded the dispatch of a B-36 unit to the FEC at that time.³⁰

The exact subjects of Sino-Soviet discussion at Moscow were never made known by the Communists, but on 16 September 1952 they issued a communique which stated that political and economic questions had been discussed, that decisions had been made for strengthening and developing Sino-Soviet friendship and cooperation, and that measures had been taken to strengthen peace and international security. The only specific announcements were that the Changchun Railroad in Manchuria would be returned to Chinese control by 31 December 1952 but that Soviet forces would continue to use Port Arthur until the USSR and Red China made peace with Japan.³¹ At the Panmunjom truce talks the Reds remained as obdurate as ever, and finally on 25 September 1952 President Truman directed CINCUNC to make one last summarization of the UNC pro-

posals in reference to the POW's on 28 September, and then, if the Communists had no constructive proposals on 8 October, to recess the truce negotiations. These instructions were carried out as ordered, and on 8 October 1952 the truce talks were indefinitely recessed.³² At this juncture General Clark informed the JCS that he was "of the firm conviction [that] the basic, underlying reason for failure this far to achieve an armistice is that we have not exerted sufficient military pressure to impose the requirement for an armistice on the enemy."³³ As the negotiations were recessed, CINCUNC was under instructions from President Truman "not to lessen" the military pressure which was being so "effectively" applied against the enemy.³⁴

Massed Attacks Against Pyongyang Military Targets: Believing that there were psychological benefits to be derived from punishing the enemy at the seat of the North Korean government, General Weyland during mid-May 1952 had requested permission to launch a massed air attack against a great number of military targets which had been pinpointed in the North Korean capital city of Pyongyang.³⁵ After coordinating his action with the senior UNC delegate at Panmunjom and securing approval from the JCS, CINCUNC on 5 July 1952 granted authority for such an attack, provided that only military targets would be bombed, that attacks would be made by either visual means or by shoran, that positive measures would be taken to protect a UNC POW camp located in the city, and that every effort would be made to avoid needless civilian casualties. FEAF was further authorized to request naval participation in a coordinated UNC air strike.³⁶

Having gotten the necessary permission, FEAF on 11 July executed operation PRESSURE PUMP which sent three waves of 822 Fifth Air Force and Navy fighter-bombers against Pyongyang targets. That night, 54 shoran-directed B-29's hit eight targets which had been saved for them. UNC losses in this massive day's work were a single F-84 and two aircraft from Task Force 77. The aerial blow was quite successful against a complex of supply depots, factories, headquarters and troop billeting areas, railway facilities, and gun positions at the enemy capital. Examination of assessment photos showed that at least three out of 29 targets were completely destroyed and that all but two were heavily damaged, an excellent

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record considering the fact that many of the targets covered large areas and included numerous buildings. A CCRAK report stated that three truckloads of corpses were carried out of the completely destroyed underground offices of the North Korean Ministry of Industry, and a direct hit on an air-raid shelter used by other high-ranking Communist officials was reported to have inflicted 400 to 500 casualties.³⁷

On 4 August a major Fifth Air Force fighter-bomber attack was launched against a military headquarters located just east of Pyongyang, and in this mission 284 participating aircraft destroyed 80 buildings, a fuel dump, and six gun positions and killed an undetermined number of enemy troops.³⁸ Pyongyang City was also restudied and retargeted, and, late in August, Generals Clark and Weyland agreed that a second massed attack against that city might have favorable repercussions at the Moscow conference. Photographic coverage showed heavy military activity throughout the city, and there were numerous agent reports of many troop and supply areas located in the built-up area. After careful planning and coordination, a total of 1,080 Fifth Air Force and Navy aircraft attacked a total of 45 target areas in the Pyongyang complex in three strikes on 29 August. Bomb damage assessment photographs revealed moderate to severe damage to 31 of the 45 targets in the city.³⁹

In support of these massed air strikes against Pyongyang, FEAF implemented psywar plan BLAST. The day before the bombings, 150,000 of leaflet No. 1123 were dropped at Pyongyang, expressing the theme of "Bomb Warning." Five days after the attack 150,000 of leaflet No. 8281A, with the theme of "General Civilian Bomb Warning," were released in the same area. The written text of both of these leaflets urged civilians to stay away from military installations of any kind because all such military targets would be bombed.⁴⁰ The purpose of BLAST was to disrupt the Communist civilian order and to convince the people of Pyongyang of the hopelessness of the Red cause. Although such bold warnings should have alerted the Red defenses, the two massive strikes went off without excessive damages: Sabres and Meteors successfully covered both of them, and flak suppression aircraft among the fighter-bombers kept Communist antiaircraft artillery under control.⁴¹

After the massive strike on 29 August, FEAF decided that Pyongyang had been attacked enough, at least for the time being. The enemy had increased his defenses from 64 to 110 heavy and automatic weapons, which, together with the dispersed nature of most of the remaining targets, made the city a doubtful objective for fighter-bombers. Two targets in the supply area still needed attack and could have been practicably attacked by medium bombers, but the targets were too close to a UNC POW camp to take the chance.⁴² Pinpoint attacks against specific objectives in the Pyongyang area would continue as necessary.

Light Bomber Attacks Against Communications Centers: Dissatisfied with the result that the B-26 night intruders were getting against night moving vehicular and rail traffic* and immediately motivated by the fact that the FEAF operational policy directive accorded a low priority to vehicles and railway rolling-stock, General Barcus on 20 July ordered the execution of a plan which was intended to deny the enemy the villages in which he was storing supplies while enroute southward. A joint Fifth Air Force-Eighth Army study of critical crossroads in North Korea revealed that there were a good number of vehicular repair areas, supply areas, and military personnel lay-over locations which could be attacked by light bombers. The destruction of these villages could be reasonably expected to result in a two-fold advantage to the UNC war effort: stored supplies, vehicles, and personnel would be destroyed and effective roadblocks would be established until such time as the enemy could clean up the debris. After attacking the villages, the B-26's could return southward over the MSR's and attack such vehicles as might be sighted during their withdrawal.⁴³ Although the light bombers were directed to begin these communications center attacks in night missions there was a recognition that such attacks could be more efficiently prosecuted in daylight, provided the targets were not too well defended, either by guns or by MIG's; the two light bomber wings were therefore instructed to regain a daylight formation-bombing capability.⁴⁴

Originally 35 key supply centers and road junctions were targeted by the Fifth Air Force for light bomber attack but this target list was later

*See pp. 100-11.

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revised to include 78 of these communications centers.⁴⁵ In support of these communications center attacks, FEAF recommended and the FEC psychological warfare agency implemented psywar plan STRIKE. Beginning on the night of 13 July, aircraft dropped FEC leaflet No. 1205 which showed a map of northwest Korea with the MSR's outlined in red and warned civilians that all military targets along these routes would be attacked. This leaflet, entitled "You Are Next," was directed at the 78 towns known to house Communist military installations and supplies. Prepared for dropping in an area after an air attack was FEC leaflet No. 1206, entitled "You Were Warned," and designed to impress civilians with the credibility of UNC leaflets.⁴⁶ It appears that the Fifth Air Force operations directorate was initially somewhat fearful that the psywar plan would stir up the enemy defenses against the vulnerable B-26's,⁴⁷ but General Barcus went even a step further than the psywar plan on 5 August and publicly announced the names of the 78 North Korean towns which were going to be attacked by the light bombers. Already the light bombers had attacked Sinchon and Yonan, and preparatory to the attacks the civilian population had been warned by leaflets and by radio broadcasts, which continued right up to the time of attack, that their villages were going to be bombed.⁴⁸

As the light bombers began these communications center attacks, aircraft and crew capabilities dictated the tactics which they employed. Lacking a shoran capability for night operations, the light bomber wings utilized pathfinder and bomber stream tactics. In such an employment, an experienced combat crew departed the home base approximately 30 minutes in advance of the first aircraft of the bomber stream. The lead aircraft, or pathfinder, located the assigned target, marked it initially with flares, and then started fires with M-76 fire bombs and M-20 incendiary clusters. Once the target was lighted by burning buildings, the pathfinder called in the bomber stream of individual B-26's, spaced at 5-minute intervals and normally flying at 4,000 feet. These bombers dropped their loads of 500-pound M-76 fire bombs and M-47 incendiaries in synchronous bombing runs. The usual target was about one-fourth square mile in area, and B-26 crews put 50 to 60 percent of their bombs in these designated areas without much difficulty. The

success of this pathfinder and bomber stream operation completely depended upon the skill and leadership of the pathfinder crew. The target designated for attack, moreover, had to be easily recognized under visual conditions during darkness. If a target lay south of the Chinnampo-Wonsan line and was not too heavily defended by anti-aircraft artillery, the B-26's could attack it with a daylight formation. As employed after August 1952 these light bomber attacks did not differ greatly from conventional formation bombing: usually from 4 to 12 aircraft (varying in number with the size of the target) dropped their bombs on a lead bombardier from altitudes of 10,000 to 12,000 feet. Bomb strike photography and bomb damage assessment photography showed that approximately 50 percent of the bombs dropped in this manner struck in designated target areas.⁴⁹

From their beginning on 20 July these light bomber fire attacks against hostile communications centers were successful. BDA on one of the first targets hit—the Namchonjom supply center—showed that it was 95 percent destroyed. Intelligence agents within the enemy's lines forwarded enthusiastic reports: at Changyon the light bomber strike caught a battalion asleep in the village and killed 276 North Korean troops; at Pomhwa-dong an entire company was wiped out while it was assembled for a meal.⁵⁰ In October a single fire bomb attack against Pyoro-ri resulted in the destruction of 180 buildings.⁵¹ As conducted by the B-26's, however, the communications center attacks required targets which were not too heavily defended and which were readily identifiable at night. A peak month of such attacks in October 1952 fairly well exhausted the list of 78 villages, and by December the Fifth Air Force was having some trouble finding suitable targets for the light bomber streams.⁵²

Cleanup of North Korean Industrial Remnants:

A first order of business in early July 1952 was to complete the neutralization of North Korean hydroelectric facilities that had been so ably attacked by UNC air forces late in June.* Chosen No. 1 and No. 2 plants were still conceivably useful to the enemy, and on 8 July the 49th Fighter-Bomber Wing accordingly directed 41 F-84 sorties against the generators, transformer yards, and

*See Chap. II, pp. 31-32.

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penstocks at these plants.⁵³ Both Chosen plants were again attacked by naval aircraft on 19 and 20 July, and the No. 2 plant was bombed by 44 B-29's on the nights of 19/20 and 21/22 July.⁵⁴ These strikes appeared to put the Chosen plants out of order, but when more reconnaissance showed that No. 1 was at least capable of limited productivity with a minimum of repairs, this installation was attacked by 16 B-29's on 29 August and again by 50 B-29's on 1 September. Chosen No. 1 was now out of operation for the remainder of the war with all of its penstocks severed.⁵⁵

During July UNC aircraft also began attacks against such North Korean industrial remnants as could still be found. Thus on 15 July, 171 Fifth Air Force fighter-bomber sorties in morning and afternoon strikes attacked the Sungho-ri cement factory and a locomotive repair shop located near it in an abandoned limestone quarry. This cement factory had been hit before (in November 1951), but by mid-April it had been repaired and was again operating.⁵⁶ During July, Bomber Command gave careful attention to the Oriental Light Metals Plant, which was near Sinuiju and only four miles from the Yalu. This target, which had been overlooked in the 1950 strategic strikes, was successfully attacked by 63 shoran-bombing B-29's on the night of 30/31 July. This was the largest medium bomber strike against a single target in Korea, and post-strike reconnaissance showed that the militarily important factory concentration was 90 percent destroyed.⁵⁷

Just as the Superfortress attack informed the North Koreans that they had no safe haven for industry along the Yalu, Seventh Fleet air strikes let the Communists know that their industrial plants in northeast Korea were subject to destruction. On 27 July, the Sindok lead and zinc mill, a facility which reportedly shipped 3,000 tons of processed ore each month to Russia, was 75 percent destroyed by carrier-based aircraft.⁵⁸ On 2 August, carrier aircraft and a cruiser task unit pounded billeting and supply areas, an oil refinery, and other industrial targets at Chongjin. From the Navy viewpoint the most important maximum effort strike (the heaviest all-Navy attack of the Korean war) was made on 1 September against the synthetic oil production center at Aoji, a target only four miles from Manchuria and only eight miles from the Siberian border. Morning and afternoon deckload strikes of naval planes deva-

stated the Aoji plant and took out the above-ground buildings of an important iron mine, gas and oil storage facilities, and assorted manufacturing facilities at nearby Musan.⁵⁹ The Aoji-Musan target complex had been deemed to be of such unusual importance that the JCS had been willing, on a one-time basis, to suspend its rule prohibiting air operations within 12 miles of Soviet territory.⁶⁰ At the other end of the Korean border on the night of the 18 August, 14 Bomber Command Superfortresses effected 60 percent destruction on the Nakwon Munitions Plant. This installation, located only four miles southeast of Sinuiju, was reported to be producing 1,000 anti-tank and 5,000 hand grenades daily.⁶¹

While these industrial remnants were being destroyed, air reconnaissance was keeping close tabs on a frantic Communist repair effort at their giant Sui-ho hydroelectric plant. After a good many pictures had been taken, photo interpreters finally concluded that two generators were possibly operating at Sui-ho.⁶² In deference to the hazards of this area, General Weyland instructed the FEAF Bomber Command to complete the destruction of Sui-ho with a shoran-directed night attack,⁶³ and in view of the growing antiaircraft and searchlight defenses at this target, Bomber Command devoted a maximum amount of caution in planning the strike which it ran against Sui-ho on the night of 12/13 September.* Although one B-29 was lost to the enemy defenses, 32 bomb-carrying Superfortresses got over the target to drop 2,000-pound semi-armor-piercing and 500-pound demolition bombs. Post-strike photographs showed that the main powerhouse received five hits, four probables, and three near misses. At least 36 hits in the transformer and switching yards heavily damaged these installations.⁶⁴ Photo interpreters tentatively concluded that Sui-ho was neutralized,⁶⁵ but whether or not this was true continued to puzzle them. Despite superb photographs obtained by a 67th Tactical Reconnaissance Wing RF-80 on 12 October, the interpreters could not positively state that Sui-ho was not producing some power. Tailrace turbulence, at least one intact primary transformer, replacement of transmission lines, plus augmentations of AAA defenses, indicated that Sui-ho was either in limited operations or else the Reds were hoping to

*See Chap. III, pp. 73-74.

use it as an elaborate flak-trap for medium bombers.⁶⁶

In August and September, FEAF attempted to destroy as many North Korean mines, smelters, and ore concentration facilities as was practicable with air action. The Hoechang Ore Processing Plant, reported to be processing gold for shipment to Red China, was 90 percent destroyed by 20 B-29's on the night of 5 August.⁶⁷ Early in September FEAF notified the Fifth Air Force that it would be well to neutralize North Korean mines by destroying their hoists, compressor houses, machine shops, and transformer yards. The FEAF reasoning was that all of these minerals and ores were being sent to China and Russia in repayment for war costs, and their destruction would pose a drain on the whole Soviet economy.⁶⁸ During September, Fifth Air Force fighter-bombers hit a number of mines which produced gold, tungsten, and monazite for Soviet industrial and economic uses.⁶⁹ One of the largest of these mining enterprises was the gold mine and smelter at Soktal-li; this installation was targeted but could not be attacked because a POW collection point was somewhere in its immediate vicinity.⁷⁰ On the night of 30 September/1 October, 48 medium bombers almost completely destroyed the Namsan-ni Chemical Plant, an important industrial chemical target located on the banks of the Yalu near Sui-ho.⁷¹ Namsan-ni was later described as the "last of the marginal strategic type targets in Korea."⁷²

Attacks Against Communist Personnel and Supplies: The Fifth Air Force, Bomber Command, and the Seventh Fleet also devoted attention to concentrations of enemy personnel and supplies. On 4 July the Fifth Air Force sent a 70 sortie fighter-bomber attack against the North Korean Military Academy, which was near the Yalu and some 50 miles northeast of Antung. Despite air opposition from MIG interceptors,* the fighter-bombers destroyed 15 buildings. On 23 July, 214 fighter-bombers attacked a troop and supply concentration near Wonsan.⁷³

In view of the growing dearth of other lucrative targets, the Fifth Air Force on 21 August announced an intention to inflict maximum destruction on Communist military personnel. In such attacks, it intended to give a preference to killing Chinese troops, since it believed that the North

*See Chap. III, pp. 54-55.

Korean military forces now had little influence on the course of the war. Any concentration of as few as 500 Chinese troops was eligible for attack.⁷⁴ Eighteen troop concentrations were accordingly targeted and attacked during the latter part of August, and during September the majority of fighter-bomber effort went into attacks against troop encampments and concentrations, military headquarters, boat concentrations, tank concealments, supply areas, artillery positions, and other such targets. A major part of the Fifth Air Force effort was devoted to strikes against the Chinese, with 47 separate attacks being directed against these people.⁷⁵

During September a good share of these fighter-bomber attacks was made against personnel and supply targets in close vicinity to the Yalu border. On 9 September, 82 F-84's again attacked the North Korean Military Academy and again drew heated opposition from hostile MIG-15's. On 15 September, however, 24 F-84's got into Sinuiju to destroy hostile supply concentrations without any losses. That same month, Navy fliers of Task Force 77 raided the Korean border town of Hoeryong on 13 September, without any opposition other than small arms fire. On 17 September, Navy pilots pounded industrial, personnel, and supply areas at Tanchon and Pukchong.⁷⁶ Such strikes as these were designed to show UNC air power at the Korean frontiers.

As was the case with Fifth Air Force fighter-bombers, so also did Bomber Command's B-29 Superfortresses turn more and more to attacks against enemy personnel and supplies. Except for special industrial targets, the target planners were hard pressed in July to get objectives capable of satisfying the operational requirements of the B-29's. Early in July, FEAF air targets division people were so hardpressed to supply medium bomber targets that they flatly stated that the North Korean transportation system was "the only target system suitable for B-29's in North Korea."⁷⁷ During July, the FEAF Bomber Command therefore utilized aircraft not scheduled against special targets in attacks against the marshalling yards along the enemy's rail routes. Although this command made arrangements to get flash reports from the Fifth Air Force concerning significant aggregations of enemy rolling stock, its July marshalling yard strikes gave exceptionally small returns: assess-

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ment of nine missions involving 71 B-29 sorties showed only 17 rail cars destroyed or damaged.⁷⁸ On 1 August FEAF operations therefore directed that the medium bombers would thenceforth be employed against enemy materiel, military personnel, and supplies.⁷⁹ The Fifth Air Force nominated a good many such targets which were especially suited for medium bombers (many of them were too well defended by antiaircraft artillery to chance a B-26 or fighter-bomber strike), and, beginning in August, the FEAF Bomber Command set its sights on hostile concentrations of personnel and supplies. Selecting its ordnance and committing aircraft so as to achieve a desired minimum destruction of 60 percent of these supply targets, Bomber Command began methodically to eliminate some 40 to 50 small dispersed targets each month in the enemy's rear areas.⁸⁰ In view of the lack of multiplexed shoran coordinates, the medium bomber bombing accuracy against these small supply concentrations was initially poor, but as the FEAF capability to furnish such correct shoran coordinates was augmented the B-29's got smaller CEP's. At a time that it was having particular trouble with shoran targeting, Bomber Command on 19 September chanced a risky daylight mission (the first since 27 October 1951) which sent 35 heavily escorted B-29's to bomb three supply and troop concentrations at Yonpo, Tongchon, and Chigyong, all being east coast targets in an area of infrequent MIG penetrations.⁸¹

Communist Reactions to Air Pressure: Enemy propaganda broadcasts and UNC agent reports from behind the "Bamboo Curtain" were sufficient to indicate that the initial air pressure operations were hurting the enemy without giving him a chance to retaliate. As was to be expected, Communist radio transmissions were heavily charged with claims of atrocity. Broadcasts from Peking on 11 and 12 August charged that the "new program of blanket bombing of civilians is not aimed at any military targets." *Pravda* stated on 12 August that the United States was trying to "force on the Korean peoples unjust armistice conditions" and promised that the North Koreans were determined to "break up the new monstrous provocations of the American interventionists" and to "conduct their struggle to a full victory." The best indication that the air attack program

was causing the Communists considerable trouble was a reliable report of a Communist meeting which took place on 18 August to discuss the effects of UNC bombings. In this discussion, the Communists assumed that the United States was alone responsible for the air attacks. As a result of these attacks, the Communists noted that they had completely to reorganize their counterintelligence system in order to maintain tighter control over the civilian population. They agreed to dispatch special subversion control agents to those cities which had received the heaviest UNC air attacks.⁸²

A CCRAK agent report assessed as from a "usually reliable" source, which General Clark forwarded to the JCS, indicated that the heavy bombing program was having a material effect on civilian morale in North Korea. Great numbers of civilians, who earlier in the war had left the farms and villages because of food and job shortages, were now deserting their war jobs and returning to the safety of farms and villages. There was said to be some concern in the North Korean government that, because of the air attacks, many civilians would join the remnants of the UNC guerrillas which were still operating in North Korea.⁸³

Despite the official distrust of the U. S. Department of State,* the psywar warnings given to civilian populations prior to the bombing of military objectives were proving quite successful. General Harrison said that these warnings were cited in truce-table talks as an evidence that UNC air attacks were not directed against civilians. General Weyland reported that there was no evidence that leaflet drops in the 78 cities and towns had compromised air attack plans. The very audacity of the UNC warnings hurt civilian morale since it emphasized UNC control of the air over Korea and the inability of the Communist regime to ward off the announced blows. Reliable reports stated that whole villages and towns on the warned list were evacuated and that the Communists had to move in security troops in order to keep the civilian populations at work. Red security agents had diligently collected the warning leaflets and had issued threats of punishment to civilians who read them, but this procedure redounded to the credit of the UNC since the civilians now saw the

*See Chap. II, pp. 36-37.

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UNC as attempting to look after their welfare at the same time that their Red masters were try-

ing to keep them in ignorance of impending disasters.⁸⁴

INTENSIFICATION OF AIR PRESSURE

United Nations Debates on a Korean Armistice: When the truce negotiations were indefinitely recessed at Panmunjom, the arena of diplomatic discussions was almost immediately shifted to the General Assembly of the United Nations, which convened at its seventh session in New York late in October 1952. Before the General Assembly met, Mexico had proposed a possible solution to the prisoner of war difficulty whereby such prisoners as desired repatriation would be immediately exchanged at the signing of an armistice and the remainder of nonrepatriates would be ultimately disposed of by subsequent political negotiations. The U. S. Department of State had tentatively favored acceptance of this proposition, but the U. S. Department of Defense reasoned that "if the Communists did not accept our proposal on the POW's under military pressure, they undoubtedly would never do so without military pressure."⁸⁵ At the eve of the General Assembly meeting, the Joint Chiefs of Staff reiterated this same position: "It would be undesirable from the military point of view to conclude an armistice in which the disposition of nonrepatriates would be left for subsequent settlement."⁸⁶

Shortly after the General Assembly convened, Soviet Foreign Minister A. Y. Vishinsky took the offensive, proposing on 29 October that the General Assembly should set up a new commission of nations directly concerned but not participating in the Korean war to take immediate measures for ending hostilities. On 10 November, Vishinsky told the General Assembly that Russia would "never budge" from its opposition to voluntary repatriation of Korean POW's.⁸⁷ Early in November, however, it began to be evident that the Communist Chinese were more interested in securing a Korean armistice than were the Russians. Thus on 17 November, when India introduced a resolution looking toward settlement of the POW impasse, the Indian ambassador to Peking gave out the report that the Chinese Communists really wanted a truce.⁸⁸ Somewhat later, Prime Minister Jawaharlal Nehru of India would reveal that Red China had approved the basic principles

of the resolution before India submitted it to the United Nations.⁸⁹

Strangely enough, the Indian resolution drew the support first of Great Britain and then, when satisfactorily amended, of the United States, but it continued to get bitter opposition from Vishinsky, who remained insistent upon the acceptance of the Russian plan, which he elaborated to comprehend an immediate cease-fire, a subsequent 11 nations committee for arriving at a political settlement in Korea, and forced repatriation of all POW's if necessary. On 27 November Soviet propaganda broadcasts made the unusual charge that the Indian resolution was "nothing but a slightly veiled American draft."⁹⁰

The Indian resolution was approved by the General Assembly on 3 December 1952, by unanimous vote with the Communist bloc of nations abstaining from the balloting. As it finally passed, this resolution called for the establishment of a commission of four neutral nations which would handle the POW exchange and neither "prevent" nor "effect" the return of prisoners to their homelands. A subsequent Korean truce conference would take up all cases of POW's unrepatriated after 90 days. At the insistence of the United States, India had amended its original resolution to impose a further 30-day time limit for the disposition of remaining prisoners by the political conference. At the end of 120 days any prisoners not repatriated or otherwise disposed of were to be placed under the control of the United Nations for disposition in accordance with international law.⁹¹ Vishinsky had already indicated that the only acceptable plan to the USSR would be the Russian plan, and in a Peking radio broadcast on 28 November Chou En-lai had declared that his nation would not accept any settlement which did not include the repatriation of all prisoners of war. On 16 December, Chou cabled a formal refusal to accept the General Assembly's officially-voiced solution for the Korean fighting: Communist China, he said, adhered to the principle of complete repatriation, and he additionally said that the General Assembly action had been "illegal"

since Communist China had no representation on that body.⁹² The Chinese Communists had evidently succumbed to Russian pressure.

Intensified Air Operations: In coordination with a UNC amphibious demonstration off the eastern coast of Korea, the Fifth Air Force and FEAF Bomber Command executed an intensified air attack program between 9 and 18 October 1952. This amphibious demonstration had been planned for several months, and now both it and the intensified air operations took place just after the 8 October recess of negotiations at Panmunjon.

The Koje amphibious demonstration had had its origin in a CINCFE order that one regimental combat team of the 1st Cavalry Division, serving in the defense of Japan under the U. S. XVI Corps, would be rotated to security duty in Korea. In August 1952, COMNAVFE suggested that the troop movement could very well combine realistic amphibious training with a demonstration off the east coast of Korea which would lure enemy troops out onto the roads for attack by UNC aircraft and naval fire. On 13 September, CINCPAC issued an operations plan which envisaged a joint amphibious assault mounted by the XVI Corps in the Koje area, in conjunction with a two-pronged northward attack by the Eighth Army and an air-drop of the 187th Airborne Regimental Combat Team, the mission of the whole force being to encircle and destroy enemy forces and to prepare to attack northward to Wonsan. Prior to D-day, FEAF aircraft and Seventh Fleet planes and warships would bombard the amphibious objective area.⁹³

Only top-level commanders knew that the operation was a hoax, and Joint Amphibious Task Force 77—the largest naval force assembled since World War II—bore down on the objective area with grim determination. The softening-up assault was so intense that on 12 October (D minus 3) Navy pilots broke their all-time Korean daily sortie record by flying 667 sorties. At 1400 hours on 15 October, after an agonized delay caused by unfavorable weather, the 8th Cavalry RCT was launched in landing craft, proceeded on course to a point 4,000 yards from shore, and then the landing craft reversed direction and returned to the transports. Generally well-planned and well-executed, and certainly a well-kept secret, the amphibious feint failed to provoke the expected large-scale enemy troop movements. Instead, in-

tense Communist battery and flak fire took casualties from among the naval forces, including five naval pilots who bored into targets at risks which were excessive to any mere exercise. Commander *Bon Homme Richard* later protested that the Koje amphibious hoax had caused a great morale let-down among his pilots, many of whom had taken great risks in a mistaken belief that a real amphibious landing was to be made.⁹⁴ General Clark later stated that the "Wonsan demonstration . . . was enough to prove that the enemy was genuinely afraid of our amphibious threat," but that "it was also enough to prove that any assault on that beach would have been most difficult."⁹⁵

In coordination with the Koje demonstration, the Eighth Army launched on the night of 13/14 October operation SHOWDOWN, a two-battalion limited objective attack designed to seize Triangle Hill and Sniper Ridge, northeast of Kumhwa in the IX Corps area. The attacking force successfully secured its objectives, but determined enemy counterattacks inflicted heavy UNC casualties, and, after a see-saw battle, the enemy ultimately recaptured Triangle Hill. When General Van Fleet proposed other similarly localized attacks in November, General Clark stated firmly: "We should not unless absolutely necessary initiate another action which may be a repetition of the bloody battle for Triangle Hill and Sniper Ridge."⁹⁶

In support of the Koje demonstration, FEAF utilized its aircraft in a ten-day maximum effort. The 315th Air Division (Combat Cargo) carried out a four-day joint airborne training exercise with the 187th Airborne RCT at Taegu, and on 15 October flew a weather-delayed airborne feint near Chorwon.^{97*} As its part of the intensification of air attack, Bomber Command was asked to increase its daily sortie rate from 14 to 18 aircraft. On 8 October, Bomber Command began its intensified effort by dispatching 10 B-29's of the 98th Wing on a daylight mission against enemy positions near Kowon. Coordinating this attack with the naval carrier forces which were working in the same area, the medium bombers had no difficulty in placing their VT-fuzed 500-pound bombs on their assigned targets. The plan for intensified B-29 operations scheduled shoran attacks against 49 small and diversified targets, but because of

*See Chap. VIII, p. 292.

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stepped up enemy action on the ground, three close support missions were required of the mediums each day from 10 through 16 October. As a result of this diversion, the medium bombers attacked only 43 separate targets, each with an average force of four aircraft. These targets were, for the most part, supply and personnel areas, and the effort was intended to harass the enemy.⁹⁸

As laid out in planning concept, the Fifth Air Force's intensified air attack program required a 50 percent increase in programmed effort and strikes against some 50 priority fighter-bomber targets (mines, factories, radar stations, and military headquarters), 40 troop concentrations, 60 communications centers, and 500 centers of military activity located along the MSR's. Four primary targets and 4 troop concentrations were to be attacked each day by 21 to 36 fighter-bombers; 48 centers of military activity were to be attacked daily by elements of 4 fighter-bombers; six key communications centers were to be attacked nightly by light bombers. Weather curtailed planned operations to some extent on seven out of the ten days and demands for close support from the IX Corps further cut into the available effort. The fighter-bombers nevertheless flew 2,928 sorties and the B-26's flew 791 sorties against preplanned targets, and nineteen of the main fighter-bomber targets, 37 of the troop concentrations, 37 of the key communications centers, and 274 of the military activity areas were attacked.⁹⁹ Fifth Air Force crews who participated in these intensified missions were generally enthusiastic and felt that more destruction had been inflicted on the Reds than in the previous several months. Bomber Command got in some good training looking toward a compression of its B-29 bomber streams. Other than this, FEAF was unable to assess the results of its intensified operations, and the FEAF Formal Target Committee, although it sought an answer, was never able to determine "just what was accomplished by this intensified dispersion of effort."¹⁰⁰

Return to Sustained Air Pressure Operations: Following the mid-October intensified air operations, all FEAF units cut back their effort proportionately and returned to the operational schedules which they could sustain over the long run of time. Increasing emphasis was given to

attacks against concentrations of enemy personnel and supplies, mainly because the number of "special" targets was getting scarce. The general pattern of Fifth Air Force daily fighter-bomber operations required a concentration of as many as 100 aircraft against one suitable target each day, while the remainder of the fighter-bomber daily capability struck enemy supply points and other similar targets in the area generally south of a line from Pyongyang to Wonsan.¹⁰¹ On 25 October, Fifth Air Force B-26's and fighter-bombers coordinated their attacks against the Kungang Political School. This institution was the most important school in North Korea for the training of North Korean Labor Party agents, men who were expected to accomplish subversion within the Republic of Korea. FEAF had targeted and ordered the attack and on 25 October the Fifth Air Force laid it on: a day formation attack by B-26 aircraft utilized 100-pound general purpose and fragmentation bombs in an initial attack, after which fighter-bombers bombed and strafed the area. Post strike photography of this mission showed that many fires had been started and that the installation had been almost completely destroyed.¹⁰²

During November, the Fifth Air Force fighter-bombers varied the patterns of their attacks but continued relentless strikes. On 19 November a large troop concentration and supply area near Kanggye was attacked by 179 sorties in two waves, the effort marking a very deep penetration into enemy territory and emphasizing an ability to strike at will in North Korea. Again on 21 November the Oryong-dong target complex northeast of Chongju was plastered by 117 aircraft from the three F-84 wings.¹⁰³ In December the primary Fifth Air Force targets were troop concentrations, and important strikes were conducted on nine separate days against aggregations of the enemy in the Wonsan and Haeju areas.¹⁰⁴ In both November and December the Fifth Air Force continued to attack Chinese troops and enemy supplies in routine air pressure operations.

During October General Weyland was quite eager to get medium bomber strikes laid against military targets in the Sinuiju and Uiju areas, "mainly for the purpose of displaying our air strength in the sector."¹⁰⁵ In addition to their psychological importance, these targets repre-

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sented heavy military values to the Communists. FEAF targets people had discovered that the Uiju supply and communications center contained a textile mill, a vehicle repair factory, an anti-aircraft artillery school, an automobile technical school, and was reported to shelter the headquarters of the 37th Soviet Division; since the targets people could not discover the precise locations of these activities they had targeted the whole area. There was also a locomotive repair shop in Sinuiju, and Sinuiju and Uiju airfields were the only known locations of Communist aircraft in all of North Korea.¹⁰⁶ In view of the known flak and fighter defenses of the area, however, Bomber Command secured permission to defer a mission to Sinuiju and Uiju until such time as weather promised to blanket out the Communist defenses.*

While awaiting the promised bad weather which was supposed to come after mid-November, the B-29 medium bombers generally remained south of the Chongchon River line. Bomber Command during October generally attacked two targets each night, each with a force of six aircraft. In some instances such a force was insufficient to effect the desired degree of destruction on a target and the objective might have to be hit a second time, but the intention of this operational schedule was to achieve a maximum psychological impact.¹⁰⁷ In late October and early November the medium bombers gave a goodly amount of attention to the Sopo supply complex which lay a few miles north of Pyongyang. Within the villages of this area FEAF photo interpreters had plotted 106 separate supply targets, and the whole area was so well defended as to prevent fighter-bomber strikes.¹⁰⁸ Interspersed with the attacks against Sopo supplies, the medium bombers also made missions against such objectives as the Okung Lead and Zinc Mill, the Hokusen Cement Plant, and a few mining areas.¹⁰⁹ In these attacks against small objectives the shoran-bombing B-29's almost always employed 500-pound general purpose bombs. On 4 November, however, General Weyland suggested that Bomber Command and Fifth Air Force try incendiary attacks against supply concentrations; he thought that in the dry period before the snow fall these incendiaries would start fires which, feeding on underbrush and grass, would spread the work of destruction and consume

dispersed dumps.¹¹⁰ On 13 November, five B-29's accordingly used 500-pound M-120 incendiaries against a supply area at Sopo. The results were not too good (only 4.1 percent rather than a normal 60 percent of the target was destroyed) and after two more trials of the munition Bomber Command went back to a standard ordnance loading of 500-pound general purpose bombs.¹¹¹

When target weather began to worsen over northwestern Korea after mid-November, the medium bombers moved promptly against sensitive targets. On 17 November they bombed the Choak-tong mine number three, just east of Sinuiju and within sight of the Yalu. On 18 November they attacked the Sonchon supply center on an unexpectedly clear night; this target was only 35 miles from Manchuria.¹¹² Having secured an erroneous prediction that the Sinuiju-Uiju defenses would be weather shrouded on the night of 28/29 November, Bomber Command laid on a maximum effort mission: although the weather was clear and the sky was illuminated by a bright noon, 44 B-29's successfully got over the area, in three forces at 45-minute intervals.† Without a single loss, the mediums bombed the airfield and locomotive repair shop at Sinuiju and the airfield and the supply and communications center at Uiju.¹¹³ Only the supply and communications center was underbombed in this November strike, and, to complete the task, the 307th Bombardment Wing sent 14 B-29's back to Uiju on the night of 12/13 December. This time the bombers carried a mixed loading of 500-pound general purpose bombs and 500-pound M-120 incendiaries, and the combined weight of the two attacks left the Uiju center 50 percent destroyed. This was as much destruction as was desired at this time, and FEAF wrote the target off its list.¹¹⁴ On other nights in December the medium bombers operated against a good many targets north of the Chongchon and thrice went against objectives in the XE grid just south of the Yalu: enemy fighter interceptors, however, were increasingly active and they destroyed a B-29 over the Choal-tong ore plant on the night of 30 December.¹¹⁵ That the Reds were extremely cognizant of these Yalu attacks was evident on 10 December, when Krishna Menon, the Indian delegate to the United Nations General Assembly, who was obviously irked that the Chinese Reds

*See Chap. III, pp. 72-73.

†See Chap. III, p. 73.

had backed down on his peace resolution, parroted the Communist line and charged that the United

States had sabotaged the Korean peace by bombing along the Yalu.¹¹⁶

UTILIZATION OF INTERDICTION FOR PRESSURE

The Military Situation in Korea: When the FEAF leaders planned the air pressure strategy they had recognized a logical relationship of forces which went somewhat as follows: the UNC possessed air superiority and could therefore profitably exercise air pressure against the Communists; the Communists, however, possessed ground superiority and might profitably exercise ground pressure against the UNC. To negate this latter Red capability had been one of the planning objectives of the air pressure strategy. Although the FEAF operational policy directive of 10 July 1952 had marked a shift of emphasis from the all-out interdiction attacks of the previous year, this policy statement had directed that sufficient air attacks would be continued against North Korean transportation systems to prevent their being rebuilt to an extent permitting them to support a sustained enemy ground offensive. The directive also demanded that attacks against these transportation systems should be so managed as to develop concentrations of vehicles and rolling stock for follow-up air attacks.

Although FEAF did not intend to abandon interdiction attacks and was in fact planning an action against key North Korean river crossings at such time as flood waters would complement the bombing of bridge structures,¹¹⁷ it had reduced rail line interdiction effort steadily after May 1952, and by early July the effort had dwindled to almost nothing. As a direct result of this reduction in air effort, the two key North Korean rail lines, "Able" from Sinuiju to Sinanju and "Baker" from Manpojin to Kunuri (*see* figure 11), gradually increased in serviceability for through traffic and were operational about 87 per cent of the time during August 1952.¹¹⁸ Considerably fewer sorties were devoted to sighting and attacking enemy vehicles during July and August, with the result that Fifth Air Force claims of vehicle destruction fell from 1,199 in June to 431 in July and to 237 in August.¹¹⁹

On 28 August, General Banfill, speaking for FEAF intelligence, pointed out a direct relationship between the relaxation of railway attacks and a steadily improving enemy supply situation,

which, he said, was detrimental to UNC ground forces. Hostile artillery fire, as Banfill saw it, had increased in direct ratio with the restored serviceability of the enemy's rail lines, and as this artillery fire had increased so also had UNC ground casualties increased. "Although rail interdiction may not prove decisive," Banfill stated, "statistical evidence indicates that immediate resumption of the rail interdiction program is warranted."¹²⁰ At the FEAF Formal Target Committee meeting on 2 September, the FEAF air targets representative repeated these same arguments and recommended that a portion of the air effort be re-assigned to a rail interdiction program. He specifically suggested that at least one river crossing should be kept unserviceable on the "Able" and "Baker" lines.¹²¹

In response to the Banfill memorandum, General Smart demonstrated that the direct relationship claimed between rail serviceability and volume of hostile fire was "speculative in nature." The air pressure operations had elicited far more telling Communist propaganda outbursts than had earlier rail interdiction operations; hence it was not unreasonable to believe that the swelling volume of hostile fire was a retributive reaction to the air pressure operations. "Goading the enemy into eruption along much of the front with the possibility of generating truly remunerative air targets incident to a dynamic situation," said Smart, "is infinitely more conducive to . . . his defeat than allowing him to languish in comparative quiescence while we expend our efforts beating up supply routes." Had there been any conclusive evidence that the UNC interdiction program had deteriorated the Communist position to a point whereby it could be exploited without disproportionate UNC ground losses, interdiction could have been assessed as an enterprise profitable enough for continuation, but Smart said that such evidence had been "singularly lacking." Interdiction had accordingly been deemphasized but not prohibited in the new FEAF operations policy.¹²² General Smart's representative at the FEAF target committee meeting on 2 September nevertheless agreed that a limited amount of air effort would have to

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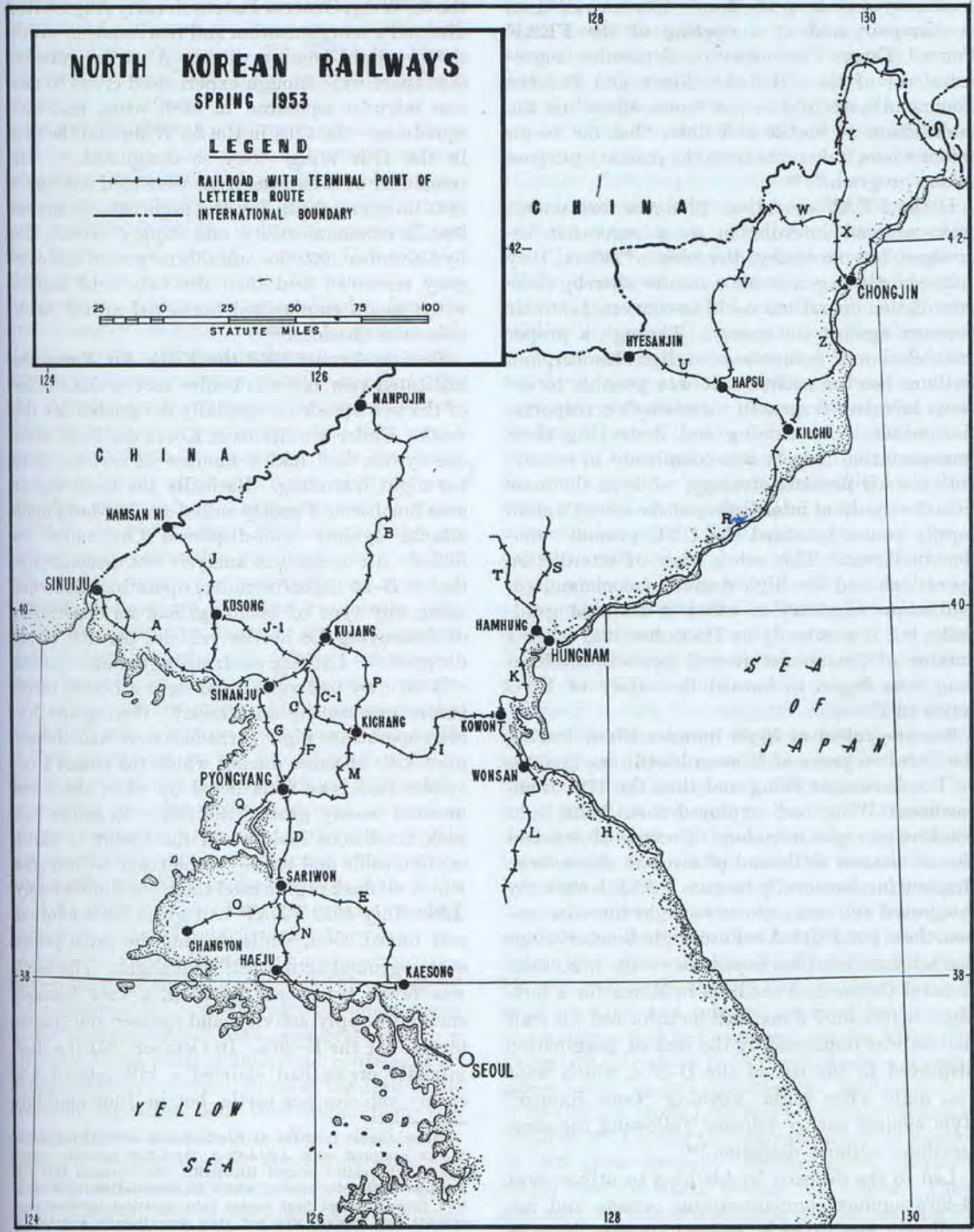


Figure 11.

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be employed to keep the North Korean rail lines in disrepair, and at a meeting of the FEAF Formal Target Committee on September representatives of the Fifth Air Force and Bomber Command were told to put "some effort" on the interdiction of hostile rail lines, "but not to an extent where it detracts from the primary purpose of our program."¹²³

If the FEAF operations planners thus undertook renewed interdiction as a somewhat begrudged but necessary diversion of effort, they quite shortly began to see a means whereby these interdiction operations could be converted into air pressure against the enemy. Through a proper interrelation of fighter-bomber, light bomber, and medium bomber activities it was possible to develop lucrative targets in the enemy's transportation system. Developing and destroying these transportation targets was completely in context with the air pressure strategy, while at the same time the resultant interdiction of the enemy's main supply routes benefited the UNC ground situation in Korea. This subtle view of interdiction operations and the high degree of command coordination necessary to effect it matured gradually, but it was ready by December 1952 when a buildup of Communist ground forces in the Kaesong area began to hazard the safety of UNC forces in Korea.

Reorganization of Night Intruder Effort: During the first two years of Korean hostilities, first the 3d Bombardment Wing and then the 17th Bombardment Wing had employed their B-26 light bombers as night intruders. Because of deficiencies of aircrew skills and of aircraft characteristics, but fundamentally because USAF lacked any integrated and comprehensive night intruder system, these two Fifth Air Force light bomber wings had achieved less than hoped-for results in Korea.* General Barcus had not been in Korea for a fortnight before on 7 June 1952 he informed his staff that he was impressed by the lack of imagination displayed in the use of the B-26's, which went out, night after night, working "Lone Ranger" style against enemy vehicles, following the same schedules without deviation.¹²⁴

Led to the decision by his plan to utilize most B-26's against communications centers and immediately motivated by several aircraft losses in

* See AHS-72, pp. 164-78.

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the 3d Wing, General Barcus in early August 1952 directed a reorganization and reorientation within the two light bomber wings. A survey revealed that there were enough experienced crews to man one intruder squadron in each wing, and such squadrons—the 13th in the 3d Wing and the 37th in the 17th Wing—were so designated.¹²⁵ The remainder of these squadrons were used during the next three months in day and night attacks against hostile communications and supply centers, but by December 1952 few suitable targets of this category remained and then the two light bomber wings again emphasized nocturnal armed reconnaissance missions.¹²⁶

During August 1952 the Fifth Air Force also instituted new night intruder tactics for the use of the two squadrons specially designated for this work. Under conditions in Korea the B-26 weapons system had had a number of serious faults for night intruding. Basically the B-26 was an area bomber and poorly suited for low-level night attacks against semi-dispersed Communist vehicles. An operations analysis test demonstrated that a B-26 night intruder, operating alone and using any type of bombing, had an expectation of destroying 1.8 hostile vehicles per 100 bombs dropped.¹²⁷ Lacking electronics guidance systems, a B-26 crew had visually to sight a hostile target before prosecuting an attack.† During the Korean operations night intruder crews had claimed most kills at times during which the enemy's rail system had been interdicted or when there was unusual enemy ground activity. In either case such conditions had forced the enemy to throw caution aside and to crowd the roads with trucks, which on dark nights used their headlights freely. After July 1952 FEAF had given little effort to rail interdiction, while during the same period enemy ground action had been slight. The result was fewer trucks on the road, a very leisurely enemy resupply activity, and sparser and sparser targets for the B-26's. In October 1951 the B-26 intruder crews had claimed a kill rate of 3.15 enemy vehicles per sortie, but in June and July

†After August 1952 the 3d Bombardment Wing tested several B-26's equipped with AN/AAS-1 Infra-Red Detector radars. These tests, called project REDBIRD, demonstrated that this airborne electronics system, which transformed infra-red radiation from a target heat source into electrical impulses on a cathode ray viewer, was not then operationally suitable for Korean night intruder work because of its lack of target selectivity, short range of detection, and numerous maintenance difficulties.

1952 the claimed kill rate per sortie had fallen to less than 0.97, whereas the loss rate of B-26's had risen to 2.6 per 100 sorties. The Fifth Air Force was thus "trading B-26's for trucks in a most uneconomical manner."¹²⁸

The revised Fifth Air Force tactics took these weapons system deficiencies into consideration. Since loss rates in low-level attacks were becoming prohibitive, crews selected for night intruder duty were generally forbidden to attack enemy vehicles from less than 4,000 feet of altitude. This altitude restriction was waived only in the case of a very few experienced crews who specialized in locomotive hunting.¹²⁹ A light bomber, flying alone and attacking from 4,000 feet, had small chance of destroying scattered, moving vehicles at night; the new intruder tactics therefore devised means to concentrate the enemy vehicles so that they would be suitable targets for bombing with the fragmentation bombs which operations analysis tests indicated were the optimum weapons against trucks.¹³⁰ Late in August 1952 the intruders were assisted by a cooperative roadblock plan: at last light, fighter-bombers attacked certain selected highway intersections to effect roadblocks, and at first darkness two intruder B-26's dropped M-83 Butterfly bombs and delayed action ordnance on adjacent feeder and secondary roads. Two major and two minor blocks were usually established each night on the highway net south of Pyongyang and on the lateral road route to Wonsan. Forty-five minutes following the establishment of a major chokepoint, and at similar intervals throughout the night, individual B-26's flew armed reconnaissance missions over the isolated roads, attacking motor vehicles with M-18 or M-81 frag bombs. The new tactics worked well: from 10 to 25 vehicles were frequently destroyed within a roadblock area, and during September destruction claims rose to 2,167 vehicles.¹³¹

A refinement of the roadblock technique, known as the "Hunter-Killer" plan, was presented to a Fifth Air Force wing commanders' conference on 20 September by representatives of the 13th Bombardment Squadron, and this attack plan was shortly afterwards put into effect. Under this technique, intelligence and operations personnel of the two light bomber wings drew up three completely different sets of roadblock areas, encompassing all assigned reconnaissance routes and each numbered for convenient reference. Before

a night's mission the "Hunter," "Killer," and flare crews were informed which particular set of pre-selected road blocks would be used that night. The first "Hunter" aircraft thereupon reconnoitered the assigned routes and determined the exact area where a roadblock would be most effective. A cross-trained navigator-bombardier in the "Hunter" then dropped a mixed load of fire bombs, general purpose bombs, and butterfly bombs to establish a roadblock. After the block was made the "Hunter" called in a flare aircraft and a "Killer" aircraft to prosecute attacks against backed-up enemy vehicular traffic. When the last "Killer" had expended his ordnance, the "Hunter" again reconnoitered the assigned routes and determined where another roadblock could be most profitably established. Having found this spot, the first "Hunter" then called in a second "Hunter" who made the roadblock and then recommenced the same cycle. These "Hunter-Killer" cycles were repeated during the night as long as traffic remained lucrative. Utilizing experienced crews, especially selected for good judgment, finest technique, and cool heads, the "Hunter-Killer" technique paid good dividends. During October 2,502 enemy vehicles were claimed destroyed. By early November 1952, moreover, the night intruders had a kill rate of 3.94 vehicles per sortie flown.¹³²

Effective with the reorganization of the light bombardment wings in August 1952, the task of locating and attacking enemy locomotives at night was recognized as a special category of effort. In some part this was due to the Fifth Air Force decision that only 500-pound bombs could "kill" locomotives, which meant that rail reconnaissance intruders required a special ordnance loading.¹³³ Trains, however, required no lights for travelling at night and they were thus best hunted on moonlight nights from an altitude of not over 800 feet. Hence a well-qualified crew who could be excepted from the 4,000-foot rule was required for locomotive hunting, and in November 1952 the Fifth Air Force had only about 12 B-26 crews who were considered well enough qualified to conduct minimum-altitude (50 to 1,000 foot) rail reconnaissance missions.¹³⁴ During the autumn and early winter of 1952 these specially qualified crews operated singly over the North Korean rail routes. They normally carried a maximum combat loading of 500-pound parachute demolition bombs internally and M-47 fire bombs or flares on their wing sta-

tions. Once a train was sighted, the B-26 crew attempted to stop it either with a 500-pound bomb or by strafing the locomotive. When the train was stopped its position was marked with a fire bomb or flare and it was then destroyed with 500-pound bombs.¹³⁵

Fighter-Bomber Night Harassment: The renovation of B-26 night intruder tactics gave beneficial results in the situation which existed in September and October 1952, but the B-26's were so vulnerable that they were generally prohibited from proceeding north of the Chongchon River. As a result of this policy Communist truckers exercised few precautions so long as they were north of the Chongchon: B-29 leaflet dropping aircraft reported that truck traffic between Sinanju and Sinuiju was lined up bumper-to-bumper almost every night.¹³⁶ Early in the Korean hostilities the Fifth Air Force had tried and abandoned efforts to use day fighters in night interdiction missions,* but during October 1952 General Barcus directed each of his fighter-bomber wings† to train two flights for night interdiction work.¹³⁷ Each of these wings prepared eight crews for night operations, and on the night of 9/10 November the 8th Fighter-Bomber Wing flew the first such mission.¹³⁸

The scheme of employment favored by these night-flying day fighters was as follows: on moonlight nights they were individually dispatched at 10-minute intervals and were positioned by a TADC over an assigned MSR. The pilot cruised at about 15,000 feet with reduced power until he spotted truck lights in considerable density and then entered a shallow glide from which he released his bombs at altitudes of from 4,000 to 6,000 feet. Because of the rapidity and quietness of the attack, enemy convoys frequently did not extinguish their lights until the fighter's bombs fell on them, and for the same reasons these fighters seldom drew any hostile ground fire.¹³⁹

On suitable moon and weather nights during November and December 1952 the Fifth Air Force employed some 16 of these night-harassing day fighters, mainly over the MSR's between the Chongchon and the Yalu. Viewed as a harassment, as the Fifth Air Force originally intended, the effort was undoubtedly successful, since it created both a real and psychological hazard to hos-

*See AHS-71, p. 45.

tile vehicular traffic in North Korea.¹⁴⁰ In the spring of 1953, however, the night-flying fighter-bombers were prebriefed to cut bridges, to make roadblocks, and to destroy vehicles. In such a destructive mission the fighter-bombers, operating at night, had notable disadvantages. Their common ordnance loading was two 500-pound or two 1,000-pound general purpose bombs, or they could carry four 100-pound general purpose bombs or four 260-pound frag bombs. They could not carry the M1A2 or M-26 clusters of M-41 fragmentation bombs, which were recognized as the best type of ordnance for use against enemy vehicles. Fifth Air Force operations analysts calculated that a fighter-bomber, carrying 500-pound bombs at night, had an expected claim per sortie rate of only 0.262 vehicles. In night attacks against bridges the fighter-bombers had an expectation of scoring hits with 4 bombs per 100, less than half of what could be expected in daylight fighter-bomber attacks against the same objectives (8 to 10 bombs per 100 bombs). As a night intruder, the fighter-bomber was thus no substitute for the light bomber,‡ nor could it work as effectively against point targets by night as it could by day, but the night-flying fighter-bombers nevertheless posed one more deterrent and hazard to Communist vehicular traffic in North Korea.¹⁴¹

Beginnings in Coordinated Interdiction: After 9 September 1952 when the Fifth Air Force and Bomber Command were directed to put "some effort" on interdiction, both of these commands initially attempted to make interdiction incidental to other operations. As might have been expected, the results were meager. Bomber Command agreed to schedule rail bridges on the "Able" and "Baker" routes as secondary targets, when ordnance and fuzing of bombs for the primary so permitted. During most of September, however, the B-29's were not diverted from their primaries, and on the night of 27 September when 12 bombers were finally sent out on a primary mission against the bridge crossings at Yong-midong, Huichon, and Sanwang-dong they did no damage.¹⁴² In

‡In January 1953, in response to a USAF query, FEAF believed that it would be economically, logistically, and operationally desirable to devise a system whereby one squadron of fighter-bombers in each wing would serve as night intruders, the squadron to be specially trained and equipped for this function. The Fifth Air Force agreed that such a solution to the intruder problem was much to be desired, but it believed that there would be a continuing need "for an all-weather aircraft capable of detecting and attacking vehicular and rail traffic."

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September "a much greater portion" of Fifth Air Force effort was committed to rail interdiction, but the main portion of this effort was put on the "Item" line between Sonchon and Kowon, where 11 bridges were attacked on 18, 19, and 24 September.¹⁴³ When FEAF questioned why "Item" was attacked rather than the more important "Able" and "Baker" lines, the Fifth Air Force replied that the latter two lines were too heavily protected by hostile flak.¹⁴⁴ These incidental interdiction operations had one positive result: "Dog" rail line southward from Pyongyang to Sariwon, unserviceable since 1951 but now found to be repaired, was put out of operations by Fifth Air Force attacks launched on 5, 28, and 30 September.¹⁴⁵ The Communists speedily repaired this "Dog" line and moved in flak which jeopardized fighter-bomber reattacks. The Fifth Air Force accordingly requested that Bomber Command destroy the rail bridge which the Communists had repaired just south of Pyongyang. On 12 November six shoran-directed 98th Wing bombers dropped four spans of this bridge, and "Dog" line remained out of operation during the rest of this month.¹⁴⁶

During the latter part of October, the Fifth Air Force began to think about interdiction in terms of its historical observations of enemy activity: when there was a significant break in the enemy's rail lines he employed trucks rather recklessly to supply his military forces. Photo reconnaissance on 19 October had shown that the Communists were building another rail bridge at Yongmi-dong, where "Able" line crossed the Taeryong River about 10 miles northwest of Sinanju. Since there were already three operational bridges at this crossing it was obvious that the Communists considered this spot to be a potential bottleneck in their main transportation route.¹⁴⁷ Proposing to keep the Yongmi-dong bridges out of operation for a month, General Barcus sent 114 fighter-bombers there on 1 November: this strike destroyed at least one span in each of the three bridges. But on 6 November, when 100 fighter-bombers went back for a second attack, these pilots discovered that the Communists had built up their AAA defenses; they lost one plane to flak and had negligible results in their bombing.¹⁴⁸ Some 200 tons of bombs and two heavy attacks put this rail crossing out of commission for only three days, and after 6 November the Yongmi-dong defenses

were obviously too strong for fighter-bombers. Yet in some degree the Communists must have been intimidated since photography flown on 28 November showed that they had started building a fifth rail bridge at the Yongmi-dong crossing.¹⁴⁹ During December the Fifth Air Force continued to target bridges at Yongmi-dong and Sinanju for an attack at such time as their defenses might fall off, and it continued a moderate rail interdiction effort on the "Dog" and "Item" lines. Rail bridges were the usual objects of attack, but if these bridges were too heavily defended the fighter-bombers cut the rails or attacked tunnels.¹⁵⁰

Although the Fifth Air Force rail attacks successfully tied up Communist rail traffic for no more than short periods of time, they quite probably contributed to the success of concomitant anti-vehicle campaigns. During November the Fifth Air Force obtained good results with a MSR interdiction plan called CHOKER. This plan coordinated fighter-bomber and light bomber strikes against road bridges: at last light the fighter-bombers attacked selected road bridges, shortly after dark roadblock B-26's hit similar objectives, and then during the night other night intruder light bombers reconnoitered and bombed the Communist vehicle traffic which stalled behind the blown-out bridges. Even though hampered by unfavorable weather, CHOKER was said to have been "highly satisfactory," and during November the Fifth Air Force claimed to have destroyed a total of 3,139 Red vehicles.¹⁵¹ Early in December, the Fifth Air Force effected detailed "Truck-Killer" plans, whereby the fighter-bombers made road cuts at last light, the light bombers attacked vehicle concentrations during the night, and first light fighter-bomber sweeps sought out and attacked such vehicles as had not gotten under cover. Poor flying weather prevented the fighter-bomber sweeps from contributing much to this operation, but during December the Fifth Air Force claimed destruction of 2,321 vehicles, with the B-26's getting all but 157 of these kills.¹⁵²

During November and December 1952 the cooperative employment of fighter-bombers and light bombers generally replaced the "Hunter-Killer" techniques which the B-26's had used in September and October. And during the last week of December 1952 another form of cooperative attack superseded the lone-wolf search-and-attack tactics which the specially trained locomotive-hunting

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B-26 crews had been employing. Tried and almost immediately abandoned was a plan by which a REDBIRD B-26, equipped with an AN/AAS-1 infra-red detector and carrying a full load of flares, sought to locate locomotives and keep them illuminated for attacks by a locomotive-busting B-26. Found more practical, and soon called project SPOTLIGHT, was a cooperative employment of 12th Tactical Squadron RB-26's and B-26 night intruders. In this employment, an RB-26 made a visual reconnaissance until it located a train; the RB-26 then called in a B-26 night intruder and lighted the target with flares for the attacking aircraft. When the locomotive was destroyed, the RB-26 took bomb damage assessment photographs. This project paid off almost immediately: on 30 December 1952 an RB-26 located five locomotives in one marshalling yard and two night intruders destroyed four of them and damaged the other one.¹⁵³

Cooperative Attacks Keyed to Chongchon Estuary Bridges: During December 1952 more than 81,000 Communist vehicles were sighted moving by night in North Korea. This was the largest number of vehicles observed in any month since October 1951, when UNC aircraft had been interdicting North Korean rail lines as a major activity. Some part of the increase in December sightings might be attributed to the modest Fifth Air Force attacks on rail bridges, but there were also reports that the enemy was reinforcing and regrouping his forces to support a major ground offensive to be launched early in 1953. The sightings of December 1952 and early January 1953, moreover, showed a heavy pattern of enemy movements southward into the Haeju and Kaesong areas.¹⁵⁴

Seizing the advantages of the shelter from UNC air action afforded them by the HOLY LAND demilitarized zone around Kaesong and Panmunjom, the Communists from the start of truce negotiations had made Kaesong a staging, resupply, and espionage center for the entire western ground front. At the same time that they crassly ignored the sanctity of the demilitarized zone, they protested a few actual and many alleged instances wherein UNC aircraft inadvertently flew over Kaesong or Panmunjom. Under the security arrangements, moreover, the Communists were permitted to run a daily supply convoy to and from Pyongyang and Kaesong without danger of UNC air attack. These daily convoys

furnished courier service and resupply to a major military headquarters in the Kaesong area. With armistice negotiations recessed, CINCUNC saw no good reason why the Communists should continue to enjoy so many advantages: on 2 January 1953 the UNC military liaison officer at Panmunjom informed the Communists that occasional UNC flights could be expected over Kaesong and Panmunjom. No more did the UNC propose to accept the "picayune complaints" which the Reds had been registering on "every slightest pretext."¹⁵⁵ After CINCUNC had cleared the matter with the JCS, the UNC military liaison officer further informed the Communists on 15 January that, beginning on 25 January, they would be permitted to run convoys from Pyongyang to Kaesong on only one day each week. Instead of daily nine-vehicle convoys, immunity from air action would be extended each Sunday to one convoy of six trucks and three jeeps from Pyongyang to Kaesong and another similar convoy from Kaesong, provided these trucks were well marked with red panels, departed their starting point by 0700 hours, and reached their destinations by 2000 hours the same day. CINCUNC emphasized the fact that the UNC was ready to resume armistice discussions whenever the Communists expressed in writing that they were ready to accept one of the UNC proposals of 28 September 1952 or to offer a constructive proposal of their own which might lead to an honorable armistice.¹⁵⁶ These actions cut down on an otherwise free flow of supplies to the Communist military forces around Kaesong.

On 2 January 1953 General Barcus proposed cooperative Fifth Air Force and Bomber Command attacks against the Communist transportation system. First, he wanted to destroy all rail bridges in the Sinanju and Yongmi-dong complexes of the Chongchon River estuary, the key road bridge crossing the Taeryong River south of Pakchon, and the two road bridges crossing the Chongchon east of Sinanju. Subsequently, he wanted to destroy rail bridges on "Able" line west of Kwaksan, on "Jig" line at Namsi, on "Baker" line at Sinhung-dong, and on "George" line south of Opari. General Barcus thought it advisable to accomplish the initial attacks as quickly as possible: if any time was lost to darkness or bad weather he anticipated that the Communists would bolster the defenses of the bridge complexes. He

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therefore recommended that the FEAF Bomber Command should participate in the attacks. FEAF approved this operation and ordered the FEAF Bomber Command to take a hand in the cooperative attack.¹⁵⁷ In December 1952 Bomber Command had already declined an invitation to bomb the Yongmi-dong bridges on the grounds that the destruction of five dispersed bridges would require an excessive number of B-29's,¹⁵⁸ but now in January 1953 it agreed to use its bombers against the marshalling yards in the vicinity of Sinanju. These B-29 attacks were expected to destroy the rolling stock backed up by the destruction of the key rail bridges.

The Fifth Air Force fighter-bombers began to attack the designated key bridges in the Chongchon estuary on 10 January. Missing the next day because of weather, they concluded their bridge attacks on 15 January. In addition to the Chongchon bridges, other attacks were made as planned against bridges to the northwest on "Able" line, to the northeast on "Baker" line, and to the south on "George" line. In these six days of activity, Fifth Air Force fighter-bombers flew 1,166 sorties, 453 against bridge targets and 713 in flak suppression. Throughout the operation, light bombers and fighter-bombers made harassing night attacks against enemy repair activities. Sabres covered and screened, and between each strike reconnaissance aircraft darted in to get the pictures needed to keep flak maps current. On the nights of 9/10 through 14/15 January, formations of from four to six B-29's bombed the marshalling yards at Maenjung-dong, Sonchon, Anju, Pugwon, Hapocham, Kwaksan, Chongju, Kunuri, and Chongnyong-ni.¹⁵⁹

The principal positive achievement of these rail bridge attacks was the interdiction of hostile rail traffic on "Able" line for 11 days and on "Baker" line for 5 days. On the negative side, a good many things had gone wrong. The operation had consumed approximately 54 percent of FEAF's combat effort during the period it was laid on, and, in spite of the magnitude of the flak suppression effort, Red ground defenses shot down 7 fighter-bombers and inflicted major damage on 12 others. Over the Anju marshalling yard on the night of 10/11 January, Red night fighters shot down a B-29. For these bridge attacks the Fifth Air Force had relaxed its rule which fixed the minimum altitude for fighter-bomber bomb re-

leases at 3,000 feet, and the lower attacking altitudes had no doubt contributed to higher than usual casualties. But, as General Barcus had predicted, the Reds had also made the most of the respites afforded by night and bad weather to augment their ground defenses. Around the key bridges they built up their antiaircraft artillery from 135 weapons (95 heavy and 40 automatic weapons) on 9 January to 214 weapons (139 heavy and 75 automatic weapons) on 21 January. While flak intelligence had made every effort to keep current, the enemy had constantly shifted his flak emplacements, with the result that many suppression sorties were aimed against positions no longer active. Quite disappointing was the fact that the B-29 marshalling yard attacks had not been very effective: although extremely heavy loadings had been noted in the marshalling yards, especially on "George" line between Sinanju and Pyongyang, these loadings had not begun to accumulate until three to seven days after the first bridge cuts. The B-29's had actually begun to attack the marshalling yards on the night before the first fighter-bomber attacks, and they had curtailed these attacks before accumulations of rolling stock had become really lucrative.¹⁶⁰

Frenzied Communist repair activities at the Sinanju-Yongmidong bridges indicated that the coordinated rail attack had been aimed at a most vulnerable spot in their transportation system. First noted on 23 January was an amazing project which clearly demonstrated that the Reds stood in mortal terror of losing control of their rail lines where they crossed the Chongchon estuary. In order to bypass the Chongchon area, the Reds began the construction of a new 70-mile long single-track rail line (called "Jig-1" and "Charlie-1") connecting Kusong, Kunuri, and Sinpyong-ni. This project, when completed by 15 April, would connect the Namsan-ni and Chongju ("Jig") line to the Sinanju-Manpojin ("Baker") line. Additional bypass bridges were built at a number of other key rail crossings.¹⁶¹

During the week in which their principal rail lines were interdicted, the Communists had to employ vehicular resupply: for the week of 16 through 22 January sightings of Red vehicles totalled 34,383, establishing a new all time high for a week's sightings during the Korean war. Most significant was a large increase in traffic south of Pyongyang, leading into Haeju and Kae-

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song. "Such unusual enemy activity," said FEAF intelligence, "might normally be associated with a pending offensive," and such a conclusion was reported to CINCFE.¹⁶² The heavy volume of enemy road traffic provided new opportunities to the B-26 night intruders, and the Fifth Air Force claimed 2,582 enemy vehicles destroyed in January and 2,850 in February.¹⁶³ During January a cover of snow over North Korea enabled the night intruders easily to pick out the well-travelled roads, especially on a moonlight night, and they put emphasis on roadblocks, the design of the effort being both to slow down the enemy vehicles and to force them to use their headlights. Several other changes in intruder tactics were made in January. Having examined claims records, operations analysts determined that B-26 intruders got maximum results when they made not more than four bomb releases during a pass over an enemy convoy; this detail was added to the intruder operating procedures. Since heavy enemy vehicular activity was met well south toward the battle line where attacks from enemy night fighters were relatively infrequent, use was again made of "Firefly" C-46 and C-47 flare aircraft of the 6167th Air Base Group* for searching out and then lighting targets for B-26 intruders during the dark phase of the moon.¹⁶⁴ This flare support was continued in February, but somewhat greater emphasis was placed on cooperative B-26 roadblock and attack tactics: one B-26 blocked a road and then diverted succeeding aircraft to accomplish a maximum destruction of backed-up traffic. Early in March, "Road Block Buddy" tactics were used: two aircraft, each with an identical load of frags and flares, were dispatched at five-minute intervals to work the same road. One aircraft stayed high to provide illumination, while the other worked low and put in a roadblock. When the low ship had expended its ordnance, it climbed up to provide flare support for its buddy. "This system," reported the 3d Wing, "has proven to be only moderately successful."¹⁶⁵

During January, when their rail traffic was disrupted, and February, when they evidently worked overtime to make up for lost supply, the Communists concealed their trains less cautiously than usual, and there were abnormally large sightings of Red trains on the west coast routes. "Spot-

*See Chap. VI, pp. 228-29.

light" cooperation between RB-26's of the 67th Reconnaissance Wing and locomotive-hunting intruder B-26's continued to give excellent results: 33 Communist locomotives were claimed destroyed in January and 29 in February 1953.¹⁶⁶ Both light bomber wings worked to supplement and to replace the RB-26's with their own suitably modified aircraft, and several glassnose B-26C aircraft were modified to carry K-19 cameras and maximum loads of M-46 and M-120 flash bombs; through trial and error these intruder photo crews improved the usefulness of their photography, and by April the 3d Wing was employing two of its own photo aircraft each operational night.¹⁶⁷ Early in February the 17th Wing got good results against locomotives by dispatching a B-26C, followed at a 10-minute interval by a B-26B hardnose aircraft. Primarily the glassnose aircraft located and stopped trains for destruction by the hardnose plane. These tactics were peculiarly effective in the mountainous area of eastern Korea where the hostile rail lines had many tunnels. On being warned of the approach of the first B-26, a locomotive would usually run and seek refuge in a tunnel; quite frequently the locomotive was just emerging from its shelter when the second B-26 came along and destroyed it.¹⁶⁸ Such cooperative techniques worked well in January and February when there were a large number of train sightings, but beginning in March there were fewer locomotive sightings and fewer opportunities for attack, and it was too expensive in B-26 effort to continue to utilize pairs of aircraft in route searches against sparse objectives.

Operation SPRING THAW: Moderately apprehensive that the increased Communist vehicle movements might mean that the Reds were going to make a ground attack, CINCFE on 31 January 1953 requested FEAF to intensify its reconnaissance.¹⁶⁹ The Fifth Air Force accordingly concentrated its reconnaissance effort immediately behind the enemy's front lines back to some 20 miles to the rear of the front, and this effort gave very little evidence that the enemy was preparing to attack.¹⁷⁰ Since he had stated that he was not prepared to take excessive losses in rail interdiction, General Barcus used his fighter-bombers fairly cautiously: after the Chongchon estuary bridge attacks in January, for example, the fighter-bombers had some fair success in harassing enemy repair activities by dive-bombing them from re-

lease altitudes of about 20,000 feet.¹⁷¹ The Fifth Air Force also formalized and tightened up its procedures for reporting and attacking fleeting targets.¹⁷² Toward the end of February, the enemy began to make some daylight vehicle movements, and on 26 February the Fifth Air Force accordingly instituted routine armed reconnaissance over the northwestern MSR's. This fighter reconnaissance, however, had modest results: during February the F-84's claimed the destruction of only 58 enemy vehicles.¹⁷³ Just as the redoubled reconnaissance indicated, the enemy's limited objective offensive, expected to occur during late January or early February, failed to materialize: enemy offensive ground action continued characterized by several company-sized and one battalion-sized probing attacks.¹⁷⁴

As of the end of February 1953 the Far East Command estimated that the Communist ground armies had accumulated enough supplies to the rear of their front lines to permit them to undertake a 17- to 24-day offensive.¹⁷⁵ The Communists, however, had not mounted an all-out ground offensive during February, and for a period after mid-March any Red offensive would be hampered by the spring thaw. From early May until the first part of July would be the next period during which the Reds were likely to mount a ground attack.¹⁷⁶ Cognizant of these intelligence predictions, FEAF planners meant to undertake another coordinated attack, which timed to coincide with the spring thaw would disrupt Communist supply lines, destroy a goodly amount of their transportation capability, and force the Reds to use up some of their accumulated forward area logistical stocks.

One of the main deficiencies of the Yongmi-dong and Sinanju bridge attack campaign had been a failure to capitalize upon the accumulations of enemy supplies and equipment which had occurred when the bridges were cut. Early in March, FEAF planners therefore sketched an operation that would be executed later that month when the spring thaws mucked enemy supply routes. In concept, Operation SPRING THAW was intended to destroy enemy supplies and transport which would be backed up by severing the Yongmi-dong bridge complex. This time, Bomber Command was to initiate the operation by attacking and reattacking the Yongmi-dong rail crossings. Since it had the more flexible force, the Fifth Air

Force would conduct intensified reconnaissance of the rail routes to the north and south in order to locate and to attack backups of supplies and equipment. Both Bomber Command and Fifth Air Force would stand prepared to conduct attacks against all lucrative backups, and the Fifth Air Force would also be prepared to help the medium bombers by cutting such of the Yongmi-dong bridges as the B-29's did not destroy.¹⁷⁷ During this operation the Fifth Air Force also meant to attack selected road bridges, initially along the Sinanju-Pyongyang MSR where there was little flak and later, if as anticipated the enemy moved in automatic weapons on this road, further to the north on this MSR. The fighter-bombers would attack such selected road bridges during the last hours of daylight; the intruders would attack resultant concentrations of vehicle road traffic; and just before daylight other roadblock B-26's would establish new obstacles which would stagnate vehicles for the benefit of early morning fighter-bomber sweeps.¹⁷⁸

On 18 March 1953 the Fifth Air Force initiated the SPRING THAW operation against the "Red" supply routes (*see* figure 12) which ran southward of the line Pyongyang to Wonsan, and from 18 to 31 March preparatory attacks and subsequent armed reconnaissance and intruder missions by day and night were productive of a "partially to moderately successful operation." Prebriefed bridge strikes destroyed 37 road bridges, damaged 34, and cut the roads in 94 places, while armed reconnaissance and roadblock B-26's destroyed an additional 13 bridges, damaged 22, and made 40 road cuts. The planned cooperation between Fifth Air Force fighter-bombers and light bombers required a closeness of timing which was generally hampered by the poor navigational weather prevailing at the time: during March the Fifth Air Force claimed the destruction of 2,005 enemy vehicles, nearly half of the kills being accounted for during the SPRING THAW operations. The F-84 fighter-bombers, which were charged with early morning sweeps, claimed the destruction of only 114 enemy vehicles during the month. Sightings of enemy traffic nevertheless demonstrated that the Reds were forced to use their boggy secondary roads more frequently than usual, and the Fifth Air Force concluded that the effort "caused . . . a slow-down of vehicular traffic."¹⁷⁹

The cooperative attacks which were keyed to the

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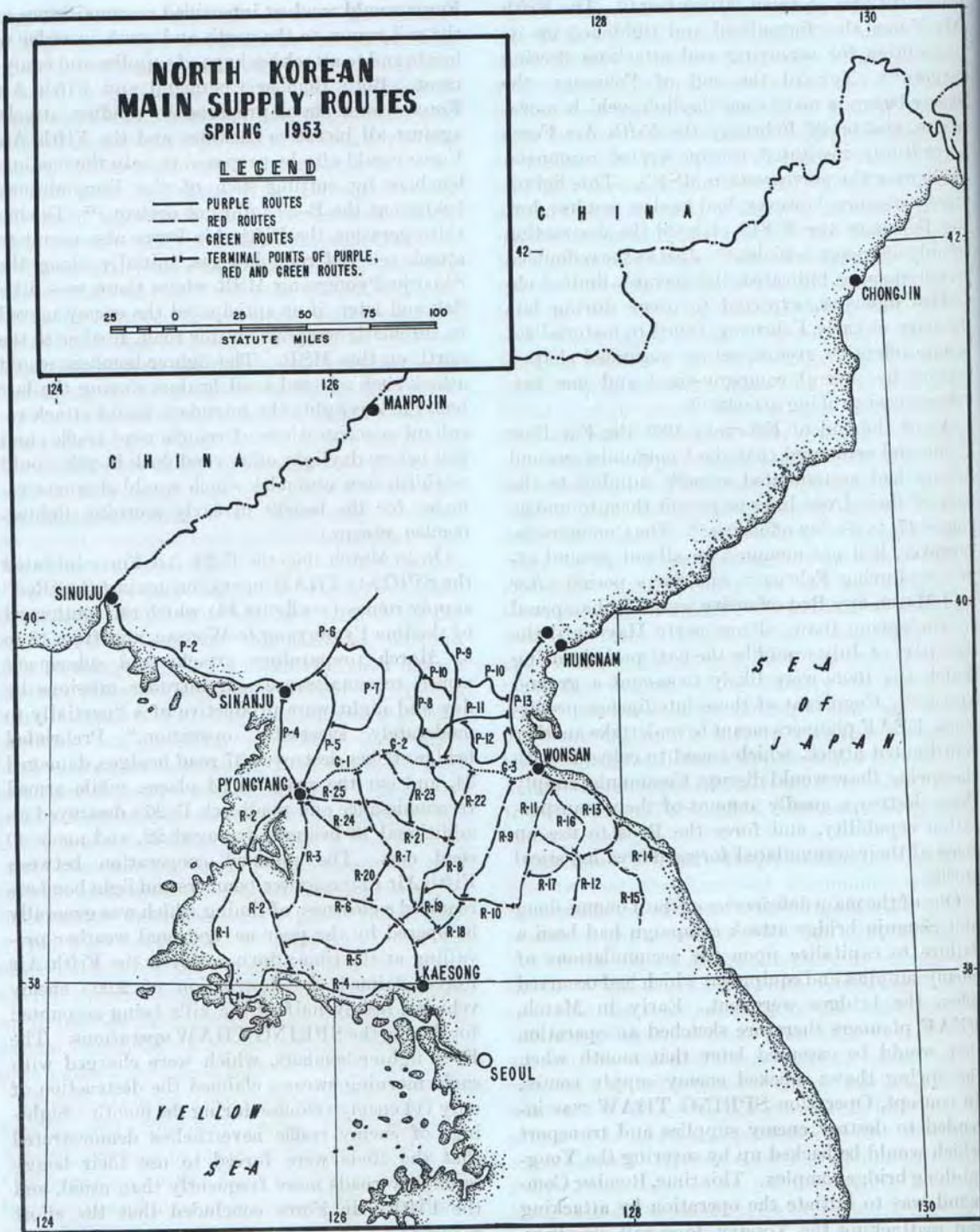


Figure 12.

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destruction of the Yongmi-dong rail bridges were less successful. On the night of 21/22 March, 18 B-29's knocked spans out of two of the principal bridges and made a third unserviceable with cuts on its approaches. On the night of 22/23 March, 8 B-29's returned to cut the damaged bridge, but while they were successful on this task they noted that the Communists had already repaired one of the bridges which the B-29's had severed the night before.¹⁸⁰ "We were able to hit the bridges pretty well," said General Fisher, but "the Communists were able to put one of them back into operation within twenty-four hours."¹⁸¹ After these two attacks Bomber Command did not return to Yongmi-dong because it believed that "another attack might have been costly in terms of aircraft losses."¹⁸² Just to be sure that it got prompt sightings of backed-up rolling stock, the Fifth Air Force had implemented a novel search plan: at the end of their first and third daily Yalu patrols, four flights of Sabres dropped down and swept homeward over the "Able," "Baker," "George," and "Jig" rail lines. These Sabres reported lucrative sightings to the JOC. Follow-up F-84 strikes, timed to coincide with the second and fourth Yalu patrols, were supposed to go out and attack the lucrative and fleeting traffic concentrations.¹⁸³ Almost immediately following the 21 March B-29 bridge cuts, some 15 trains were spotted, but poor flying weather permitted only one effective follow-up strike by the fighter-bombers. The bad weather also militated against successful Fifth Air Force attacks against a number of enemy supply buildups: the fighter-bombers could not get acceptable target weather and the B-26 light bombers lacked a shoran capability and could not attack these point targets during adverse flying weather.¹⁸⁴ These targets dissipated so rapidly that there was evidently not enough time to schedule them for medium bomber shoran strikes.

FEAF operational planners continued to believe that a cooperative air attack against selected river crossings employing medium and light bombers and fighter-bombers could be profitable, if it had the proper timing. They resolved to try the project again early in April in the dark of the moon, when the B-29's would not be so much hazarded.¹⁸⁵ The FEAF Bomber Command consequently issued an operations plan naming the three serviceable rail bridges across the Chong-

chon River north of Sinanju as targets for attack between 4 and 10 April; the first attack would be made against all three of the bridges and any of the bridges remaining serviceable would be reattacked on each succeeding night until all three were out. On the nights of 6/7, 7/8, and 11/12 April forces of 15 B-29's were thrown against these bridges; these medium bombers had good accuracy and made all three bridges unserviceable on the first strike, made them again unserviceable on the second strike, and made two out of three of them unserviceable on the third strike. But, as Bomber Command stated, the "ability of the enemy to repair bridges was just short of miraculous," and at no time were the bridges out of operation over 24 hours. Midway in the course of these attacks, FEAF strongly urged the Fifth Air Force to harass the bridge repairs with high-release fighter-bomber attacks and with nightly B-26 frag and butterfly bomb passes: the fighter-bomber harassments, however, evidently did not greatly hamper the Communist repairs.¹⁸⁶

No lucrative targets apparently developed as a result of these Sinanju bridge attacks probably because of the exceptionally short time in which this crossing was interdicted. Early in April, however, the Fifth Air Force searches for trains and vehicles moved generally north of the Chongchon: the air action thus followed the spring thawing northward and avoided hostile flak increases which had as anticipated taken place south of the Sinanju-Wonsan line. The same tactics used in SPRING THAW were continued, and during the first half of April 423 fighter-bombers and light bombers destroyed 18 road bridges, damaged 38, and made 86 road cuts. During April a total of 2,732 Communist vehicles were claimed destroyed by Fifth Air Force pilots, more than half of them during the intensive reconnaissance operations in the first part of the month. The Fifth Air Force operations directorate believed that the increased vehicle destruction claims were due to an increasing level of skill among B-26 crews.¹⁸⁷

During the operations timed to coincide with the spring thaws in Korea, the Fifth Air Force had generally emphasized attacks against enemy vehicles and did not stress night intruder locomotive hunts. During March the rail reconnaissance intruders were required to establish low-level roadblocks with their internal parademos before going on to reconnoiter rail routes. This

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policy meant that the B-26's had used up much of their ordnance before they sighted locomotives; the policy, moreover, was hazardous since low-flying B-26's drew hostile small arms and automatic weapons fire almost everywhere along the main supply routes. In April low-level road-blocks were discontinued. In March and April the "Spotlight" rail reconnaissance combinations of intruders and flare/camera B-26's were broken up, and the latter aircraft utilized their forward bomb bay loads of frags and their wing loadings of four M-64's, four M-47's, and two Mark-VI flares in normal anti-vehicular route reconnaissance missions, and only then became available at specific orbit points for photo verification calls.¹⁸⁸ As a result of the lack of emphasis on intruder rail reconnaissance and the sparse sightings of such sorties as were flown, Fifth Air Force claims of locomotive destruction were much reduced in the two months and totalled only 11 in March and 8 in April 1953.¹⁸⁹

Attacks against Other Air Pressure Targets: During the period of December 1952 through April 1953, the Fifth Air Force devoted a principal share of its air capability to the interdiction of enemy transportation in Korea but from time to time it varied its pattern of operations with attacks against other air pressure targets. On 28 January, 48 fighter-bomber sorties attacked a troop concentration near Pyongyang, and next day 28 sorties followed up this attack. On 29 January, 46 sorties also attacked another troop concentration near Pyongyang.¹⁹⁰

During February when interdiction was light, the Fifth Air Force gave a great amount of attention to hostile concentrations of troops and supplies. Among the more spectacular attacks this month was the two-day effort against the North Korean Tank and Infantry School west of Pyongyang on 18 and 19 February: in these two days fighter-bombers of the 8th, 49th, 58th, and 474th Wings dropped 541 tons of bombs on this school, destroying at least 243 dwelling-type buildings. Troop billets near Kyomipo were blasted by 96 fighter-bombers on 2 February and by 178 of the same type planes on 9 February. On this latter date, 94 other fighter-bombers left a storage area, locomotive shop, and munitions factory in Kyomipo in smoldering ruins.¹⁹¹

So far as the Fifth Air Force was concerned, however, its "strike of the month" during February

was run against the Sui-ho hydroelectric plant. Although photo interpreters had been unable definitely to state that Sui-ho had been producing power, tailrace water indicated that two generator turbines probably were operating. Obviously fearful of a medium bomber attack, the Communists had deployed to Sui-ho some 141 heavy guns but they had unwisely reduced their automatic weapons to 26 pieces. Designing to exploit this Communist mistake, General Barcus on the afternoon of 15 February sent 24 F-84's of the 474th Fighter-Bomber Wing, each carrying two 1,000-pound semi-armor-piercing bombs, against Sui-ho's generator house and transformer yard. Screened and escorted by 86 F-86's which drew off 30 MIG's, 22 of the Thunderjets drove into Sui-ho using low-level and surprise tactics and put their bombs on their assigned targets. The anti-aircraft artillery defenses were evidently taken completely by surprise since the first four or five fighter-bombers saw no flak and that which subsequently was sent up was from heavy guns and did no damage. The fighter-bombers suffered neither loss nor damage and their bomb hits put a halt to power production at Sui-ho for several more months.¹⁹²

In the first half of March, the Fifth Air Force employed squadron-strength fighter-bomber attacks against a number of hostile troop concentrations, and during the latter part of April it exerted its major efforts against troop concentrations. During the period 16-30 April, for example, there were 48 attacks on troop concentrations by 1,129 sorties. Beginning in mid-April the light bombers were again employed in bomber stream attacks against communications centers, and 10 such targets were attacked during the remainder of the month.¹⁹³

During the first four months of 1953 the FEAF Bomber Command continued methodically to eliminate some 40 to 50 small dispersed targets each month in the enemy's rear areas. In November it had had some 200 of these supply and personnel areas targeted, and by April 1953 it had attacked 168 and had substantially destroyed 132 of them. Although this target list left "something to be desired," General Fisher reported increasing encouragement: while many of these targets appeared superficially to be nothing more than villages and civilian communities, the medium bombers set off so many secondary explosions

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and fires that it was quite apparent that the Communists were using these villages as troop billets and storage areas. "We have possibly found," wrote General Fisher early in March, "the last currently vulnerable link in the supply and distribution system for the Communist armies."¹⁹⁴

In order to thwart the Red air defenses, Bomber Command varied its pattern of operations to conform to weather and moonlight. After losses of medium bombers in January 1953, Bomber Command made no more attacks north of the Chongchon River during periods of bright moonlight or when contrails were forming at the normal attack altitudes of its aircraft. Without reducing its monthly sortie rate, it began to schedule 18 aircraft at irregular intervals and gave up sending out 12 aircraft each night. This enabled Bomber Command to have minimum combat sorties scheduled during full moon period, and also permitted the wings to gain experience in flying larger forces.¹⁹⁵

By mid-March 1953 the contrail level had lifted over northwestern Korea and was no longer a problem to the medium bombers; quite promptly these aircraft took on targets along the Yalu River. In a warm-up mission flown by 12 B-29's on the night of 13 March the housing areas at the Choaktong ore processing plant were destroyed; already the medium bombers had taken out the mine and processing plant at this installation near the Yalu. On the night of 17 March, 21 B-29's got to attack the Pungha-Dong industrial area complex which was located only three miles south of Sinuiju. In this target area were 304 single story, 8 two story, 15 barracks type, and 1 administration building. There were also several small factories in this area. In deference to the Red defenses, 4 B-29's each hit an 8-gun battery two minutes before the attacking aircraft arrived. To cause maximum confusion to enemy radars, the attacking bombers employed multiple approaches and maximum compression. Battle damage received over this sensitive target was light, and the bombers achieved 50 percent destruction in the target complex.¹⁹⁶

Impact of Destructive Interdiction on the Communists: During the months of December 1952 through April 1953 the FEAF emphasis was on interdiction, but this interdiction was of a far different type from the comprehensive railway interdiction campaigns which had been conducted

between August 1951 and May 1952.* Although the 1952-1953 interdiction effort undoubtedly slowed the movement of necessary Communist war material to the front lines, it was primarily aimed at the development of targets for air destruction. Rail and road bridges were attacked for the purpose of creating lucrative concentrations of vehicles, supplies, and materiel for subsequent attacks. Interdiction therefore became a secondary mission incidental to the general program of destruction.

Although the enemy continued to receive logistical support that was adequate for his limited ground operations, the flow of such support would not have been equal to the demands of expanded operations. Replacement of the transportation destroyed by UNC air action put a strain on the Red economy which was felt as far away as Moscow. Manchurian and Chinese rail development programs were brought to a standstill.¹⁹⁷ That the destructive interdiction effort was getting results was indicated by a change in the Peking propaganda line noted in March 1953. Whereas the previous propaganda broadcasts had played up the destructive potential of UNC "terrorist" air raids, the Chinese radio suddenly began to claim that the U. S. Air Force was not very effective in Korea. "Not half of the American claims are true, not 10 percent of the claims are true, not even 1 percent of the claims are true," said Communist correspondent Wilfred Burchett. Despite "fanatical" air efforts, said Radio Peking, the Korean railroad workers with heavy aid from Chinese People's Volunteer railway units "have resolutely maintained railway transportation." This commentary noted that 4,256 individuals had been awarded various medals of merit for their participation in rail maintenance work during "the course of the bitter struggle against the enemy aerial bombings during the past two years." The apparent willingness of the Communists to jettison the "mass destruction" line which had long been one of their major propaganda assets suggested that the effectiveness of UNC air attacks in disrupting the North Korean communications was sufficient to demand a propaganda about-face. The admitted wholesale dispatch of Chinese rail workers to North Korea and the references to the number of "merit" awards issued to those strug-

*See AHS-72, pp. 145-58.

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gling to effect rail maintenance in the face of "bitter enemy attacks" certainly gave the lie to Burchett's claim that UNC air power had failed to hamper enemy operations. The propaganda about-face suggested that enemy morale had been impaired to such an extent that the Communists felt it necessary to depreciate the effectiveness of the UNC air attack.¹⁹⁸

What North Korea looked like after a year of destructive interdiction—air attacks which were intended primarily to destroy enemy materiel rather than to sever transportation routes—was well described by the captive General William Dean, who had a rare opportunity to observe his surroundings when he was moved about from one place of imprisonment to another in the spring of 1953. "The town of Huichon," he wrote later, "amazed me. The city I'd seen before—two storied buildings, a prominent main street—wasn't there any more. If it hadn't been for the river crossing I would not have believed this could be the same place." Dean further described what he had seen in these words:¹⁹⁹

For one thing, the railroads had been smashed but repaired. I think no important bridge between Pyongyang and Kanggye had been missed; and most of the towns were just rubble or snowy open spaces, where buildings had been. It gladdened my heart to see how much damage actually had been done—but I also noticed the countermeasures. For every bridge the Communists thought might be hit by our Air, another bridge was waiting, cached neatly against the day when they'd have to rebuild it quickly. I don't mean just piles of material. There were whole bridge sections all ready to be slipped into place. Sometimes duplicate highway bridges had already been thrown across the streams, so that a bomber would have to get both of them in order to stop traffic. The little towns, once full of people, were unoccupied shells. The villagers lived in entirely new temporary villages, hidden in canyons or in such positions that only a major bombing effort could reach them. . . .

Although the few houses remaining in old villages were empty of people they weren't unused. Almost every one bulged with sacks and boxes of military supplies or food. Other supplies were carefully dumped in wild disarray, so that they'd look like junk in aerial photographs or to the pilots of planes.

General Dean's observations confirmed much that was already known to FEAF intelligence. There was one report, for example, that the Reds had evacuated every village south of the 39th parallel and had stored supplies under the cover of civilian dwellings, which they hoped would be free from air attack.²⁰⁰ Intelligence had long known of the remarkable capability of the Communists to use forced labor gangs to repair the breaks which air attack made in their transportation arteries. It appeared to General Dean, who was thinking in terms of cutting off Communist transport, that the "enemy countermeasures were improving faster than our measures of destruction."²⁰¹ But General Dean, so long a prisoner that he knew nothing of the change in FEAF air strategy, failed to reckon with the fact that the Communists could have no effective countermeasure to the positive air destruction of their supplies and equipment.

General Dean's description of the Communist village supply dumps and the "snowy open places, where buildings had been," revealed the real impact of the destructive interdiction operations. It was this relentless destruction of these supply, personnel, and communications centers, which were the "backbone and support of the Communist armies," that was paying the great dividends. The destruction of these targets, already evacuated of their civilian populations and used solely for military purposes, was making the Communist task of maintaining and supporting huge ground armies "most difficult and expensive." Military equipment and trained soldiers, moreover, were valuable to the Communists, and both were jeopardized by the sustained pressure of the UNC air attack.²⁰² In April 1953, General Fisher, whose B-29 medium bombers had by this time destroyed 132 out of 200 designated supply and communications targets and were methodically eliminating more of them each night, was "firmly convinced that this program has made the support of the Communist armies so difficult and so costly in men, materiel and required dispersion, that the Chinese want no more of it."²⁰³

AIR PRESSURE PRODUCES A KOREAN ARMISTICE

Resumption and Conclusion of Truce Negotiations: Although both governments had refused to accept the United Nations resolution proposing a solution to the prisoner of war question, it was

evident in December 1952 that Red China was much more eager to end the Korean fighting than was Soviet Russia. Chinese reluctance to continue the war was again demonstrated on 4 February

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1953, when Premier Chou En-lai called on the United States to return unconditionally to Korean truce talks at Panmunjom. Red China, he said, was ready to conclude an immediate cease-fire on the basis of agreements already reached. After such an immediate armistice the prisoner of war question could be settled at an eleven power peace conference. To the U. S. Department of State this offer was "old stuff." It was not a serious proposal but was instead nothing more than a restatement of earlier Soviet plans for ending the Korean fighting in a manner acceptable to the Communists.²⁰⁴ On 19 February, however, the JCS directed CINCUNC again to propose an immediate exchange of sick and wounded prisoners of war, and General Clark made such a proposal in a letter delivered to the Communists on 22 February: this letter stated that the UNC remained ready immediately to repatriate such sick and wounded prisoners as were fit to travel and inquired whether the Communists were ready to do the same.²⁰⁵

While the Communists remained silent on the plan for exchanging the sick and wounded, the Soviet Bloc was shaken by an announcement that Premier Joseph Stalin had died on 5 March 1953. Shortly after returning home from attending Stalin's funeral, Chou displayed evidence that the Communists were willing to seek an end to their Korean venture. On 28 March, General Nam Il announced that the Communists agreed to exchange the sick and wounded and he further proposed that the armistice delegations should resume their meetings at Panmunjom. A settlement of the entire question of prisoners of war, he said, should be made to follow the sick and wounded exchange. Chou broadcast a proposal on 30 March to the effect that the nonrepatriate problem should be resolved by placing prisoners who resisted repatriation in the custody of a "neutral state," which would make final determination as to the disposition of these prisoners. Premier Kim Il Sung of North Korea seconded the Chou proposal on 31 March. CINCUNC accepted these proposals as being sufficiently constructive as to constitute a valid basis for the resumption of armistice delegation meetings following a show of Communist good faith in the exchange of the sick and wounded prisoners. When the military liaison officers had made the necessary arrangements, Operation LITTLE SWITCH, the exchange of

sick and wounded prisoners of war, got underway on 20 April, and it ended on 3 May when a total of 6,679 Communist prisoners had been returned in exchange for 684 UNC prisoners of war.²⁰⁶

Early in April, before the Panmunjom truce negotiations had begun again, the FEAF Formal Target Committee discussed whether the air pressure operations should be continued during the coming peace talks. The committee recommended that application of the FEAF operational policy directive should continue because "the damage inflicted upon the enemy as a result of this application has been the only military pressure placed on the enemy during the past months and . . . is probably the force which has caused the Communists to . . . put forth new peace overtures." General Weyland promptly approved this recommendation.²⁰⁷

It was well that FEAF had decided to maintain the sustained air pressure upon the enemy for when the truce delegations resumed their discussions on 26 April 1953 the Communists were as intractable as ever. They had proposed that prisoners rejecting repatriation should be placed in the custody of a neutral state for a period of "explanations," but when negotiations were resumed the UNC found that the detailed Communist plans for implementing this neutral state proposal were unacceptable. The Communists demanded unlimited access to the prisoners for a period of at least six months in order to carry out a reindoctrination program. After the six months, prisoners still rejecting repatriation would be retained in custody of the neutral state pending final decisions as to their fate by a political conference. Coercion was inherent in this plan since the prisoners would be forced to choose between repatriation and indefinite detention. Early in May both sides made several concessions: the Communists agreed that the prisoners placed in neutral custody might physically remain in Korea, and the UNC agreed to accept a five nation Neutral Nation Repatriation Commission rather than a single state as the custodial agency. Czechoslovakia, Poland, Sweden, Switzerland, and India were to be represented on this commission. The two sides could not come to agreement on the length of the explanation period and on the matter of the final disposition of nonrepatriates. On 13 May the UNC presented a summarized statement of its proposals to the Communists in the form of terms of

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reference for the NNRC. When the Communist negotiators flatly rejected these proposals and used succeeding plenary sessions to make propagandistic tirades, the UNC recessed the negotiations from 16 to 25 May.²⁰⁸

Early in May, when he saw that the Communists were going to continue to obstruct the peace negotiations, CINCUNC approved several plans for FEAF attacks against sensitive targets in North Korea. On 2 May he gave approval for a medium bomber attack against the Yangsi target complex, which was 12 miles southwest of Sinuiju. "Continuing such attacks during present armistice negotiations," CINCUNC told the JCS, "is strong indication to the enemy that UNC operations have not been slowed down." A few days later CINCUNC authorized another attack designed to keep the Sui-ho hydroelectric plant inoperable. "This is military pressure which we should use," he said, "to convince the Communists that the UNC will continue, without let-up, its military operations until an honorable armistice is obtained."²⁰⁹ The possibility that another indefinite recess in armistice negotiations was in the making prompted CINCUNC to outline his plans to the JCS on 14 May for applying further military pressure on the Communists. Once again, his principal military pressure would be air pressure. Immediately after another prolonged recess in negotiations CINCUNC said that it would be possible to continue air attacks against critical targets in sensitive areas, to breach by air action about 20 irrigation dams in North Korea,* to bring Kaesong under heavy air attack after first advising the Communists that their use of the town as a military concentration point violated security agreements, and unilaterally to release about 35,000 North Korean nonrepatriate war prisoners. In the fall of 1953 it would be possible to mount a limited-objective land and amphibious attack in the Kumsong area. On 21 May, in response to a request from General Weyland, CINCUNC agreed to waive the usual 48-hour advance notice required for attacks along the Yalu in order that FEAF might freely attack the Red airfields at Sinuiju, Uiju, Hoeryong, Chunggangjin, and Hyesanjin prior to the coming into effect of an armistice. When he notified FEAF that an armistice was imminent, said CINCUNC, the

*See pp. 126-31.

48-hour notice for attacks against these airfields would be automatically waived. On 27 May, CINCUNC further authorized FEAF to make an attack against the previously unhit airfield at Chunggangjin.²¹⁰

After revising its terms of reference to include final positions, the UNC delegates presented the proposal to the Communists on 25 May with the implication that no further concessions would be made. After this presentation the UNC delegation declared a week recess in the talks that was later extended, at the request of the Communists, until 4 June. On 27 May CINCUNC sent a letter to the ranking Communist military leaders which gave added weight to the implication that the UNC had made its final offer. The 25 May terms of reference provided for an explanation period of 90 days and for final disposition of the problem of remaining nonrepatriates by a political conference. These nonrepatriates were to be released after 120 days in neutral custody if, by that time, the political conference had not reached a decision. In the discussions prior to 25 May, the UNC had insisted that Korean nonrepatriates should be released to civilian status on the effective date of an armistice, but in the final proposal of 25 May the UNC yielded to strong Communist objections and provided for like treatment of Korean and Chinese prisoners. Dropping this demand roused violent opposition in the Republic of Korea.²¹¹

When the truce meetings resumed on 4 June the Communist senior delegate opened with the statement that his side "basically" agreed with the UNC terms of reference proposed on 25 May. The Communists, however, had made revisions, consisting largely of changes in wording but some of them involving changes in meanings sufficient to require additional negotiation. In the several days which followed both sides made compromises and at 1424 hours on 8 June 1953 the senior delegates signed the approved terms of reference for the NNRC. These terms marked a complete Communist capitulation and achieved the UNC objective of voluntary repatriation of prisoners of war: in effect the terms decreed that prisoners who did not want to go back to Red territory would be freed as civilians after 120 days if a major political conference failed to solve their problem.²¹² After nearly two years of frustrating negotiations the Communist capitulation on the pris-

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oner of war issue cleared the last major hurdle in the armistice talks. Staff officer meetings had already been discussing the demarcation-line problem, and at a plenary session on 17 June the delegations of both sides officially ratified the line of demarcation which the sub-group had worked out in give and take bargaining.²¹³

Except for cleaning up the terminology of the draft armistice agreement, the work of the armistice delegations was finished, and all signs pointed toward an early signing of the armistice agreement. But on the night of 17/18 June, President Syngman Rhee of the Republic of Korea decided to take drastic action to prevent conclusion of an armistice which he had steadfastly opposed for nearly two years. In a secretly planned and carefully coordinated action, the ROK government permitted 27,000 anti-Communist Korean prisoners of war to escape from UNC prison camps between midnight and dawn. At the next plenary armistice session on 20 June the Communists demanded to know whether an armistice in Korea would include the "Syngman Rhee clique" and insisted that the UNC must immediately recover all of the released Korean prisoners.²¹⁴ Resolution of the difficulties caused by the surprise action of President Rhee would require more than a month of tedious negotiations.

As early as May, however, it had been evident that the Red truce negotiators were pacing their actions in accordance with some time schedule which remained unknown to the UNC. During May the Reds switched their ground effort from a defensive to a limited offensive, and launched company to regimental size attacks against outpost positions protecting the UNC main line of resistance. The Reds probably wanted to hold these positions at such time as the military line of demarcation was renegotiated. On 2 June CINCFE warned the JCS that a Communist attack of increased magnitude appeared likely, probably with the design of forcing the U. S. I and IX Corps back behind the line of the Imjin and Han Rivers. Such ground action would permit the Communists to sign an armistice at a time when they could claim a ground victory. After a gradual buildup of ground action, however, the Communist attack was launched on 14 June in the Pukhan valley of east-central Korea. This attack pushed Red positions some eight miles southward before it was contained.²¹⁵

When the truce negotiations were disrupted by the "escape" of the anti-Communist Koreans, the Reds obviously groped for a new official attitude. They first attempted to secure a commitment that the UNC would use force to secure a ROK compliance with armistice terms. Although the armistice delegations began to meet again on 10 July, the Communists for 10 days persisted in haggling about the escape of the Korean non-repatriates. While the Reds appeared not at all anxious to terminate the armistice discussions, they obviously desired to get such profit in the form of concessions as could be wrung from the issue. Quite suddenly on 19 July, however, the Reds dropped the Korean prisoner question and thereafter speedily wound up the negotiations. In exactly this same period a Communist ground offensive chastised the Republic of Korea. Beginning on 12 July the Reds threw battalion-sized attacks against the ROK II Corps in the hilly country between the Kumsong and Pukhan Rivers. Elements of five Chinese Communist divisions continued these attacks, and the ROK II Corps, behaving rather badly and retreating under too little pressure, was driven backwards in some disorder. In this critical juncture, General Weyland requested and General Clark approved medium bomber attacks against two more targets in the sensitive area of Korea near the Manchurian border. On 14 July FEAF asked permission to hit the Yongpong-dong target complex, where targets comprised factories, an ore processing plant, and workers' quarters, and on 15 July it requested authority to attack the Yongampo target complex, one of the Communists' main supply storage and supply transshipment points in north-west Korea. These attacks were scheduled for the nights of 16 and 18 July, but they had to be cancelled, and both Bomber Command and Fifth Air Force had to give all-out support to the ROK II Corps. Aided by virtually the entire force of UNC air power, the Eighth Army by 20 July stabilized a line and held it against diminishing enemy attacks.²¹⁶

When the Communists perceived that their ground offensive had been stopped with considerable casualties, they appeared at the truce table on 19 July with an obvious determination to end the fighting as quickly as possible. At the conclusion of this session, CINCUNC alerted all commands that only administrative details remained

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to be resolved before the armistice agreement would be signed. Following some redrawing of the demarcation line to represent the recent Communist ground gains and the completion of a large number of last-minute tasks, the final armistice agreement was signed at Panmunjom at 1000 hours on 27 July. At midnight on 27 July 1953 military hostilities were officially terminated in Korea.²¹⁷

Destruction of North Korean Irrigation Dams:

During the last three months of Korean hostilities, General Weyland continued to employ FEAF air power in a manner calculated to motivate a Communist acceptance of UNC armistice terms. In this period no single air operation so gravely affected the Communists as the simple destruction of two agricultural irrigation dams, for this operation, too terrible to execute in its entirety, portended the devastation of the most important segment of the North Korean agricultural economy.

Had target selectors not been looking for air objectives in terms of an air pressure strategy it is doubtful that they would ever have noticed North Korean irrigation dams. While studying the activities of Communist security units in the spring of 1953, Far East Command intelligence officers noted that the locations of these units followed a seasonal pattern: during the growing season these security units were deployed in the interior of the rich rice producing provinces of Hwanghae and South Pyongan, but immediately after the harvest the units were deployed to the north and south in coastal defense and lines of communications guard duty. Given this one clue that the Reds attached great importance to rice production, FEAF and FEC intelligence officers soon determined the importance of the Korean rice production to the Red regime. In nearly two years of war, UNC air power had been exclusively directed against hostile military and industrial targets, but agricultural production had remained unscathed and was the single economic asset remaining to the Communists in North Korea. The better to control their last economic asset, the Communists had brought agricultural production under rigid police authority: "undesirable" farm families had been removed and their lands had been reassigned to "reliable" sympathizers, rigid production quotas had been placed on the farmers, and drastic in-kind agricultural taxes had been levied. Although most agricultural produce was then seized by the Red government, these govern-

ment stocks did not again reach the civilian economy: both farm worker and city dweller suffered from a shortage of food and clothing. The Red government's grain was instead used to feed Communist soldiers and an important share of it was exported to China, which had been suffering from crop failures and rice famine, in repayment for military materiel. Attacks against an enemy's food supply were a traditional form of warfare, and the destruction of North Korean rice production would turn this enemy region from a food-exporter into a food-importer. "We would not hesitate to try to destroy as much rice as possible . . . in transit," pointed out FEAF intelligence. "Under these circumstances, it is difficult to rationalize a reluctance to attempt to destroy rice . . . growing in the fields, which actually would accomplish much more denial of this food than would the already accepted method."²¹⁸

Once the idea was grasped that the North Korean rice production ought to be destroyed, target researchers had little trouble figuring how this could be done by air attack. Approximately 70 percent of Korean rice lands required some form of controlled irrigation, and the Koreans customarily stored water in reservoirs for use in the April and May rice planting seasons. Within North Korea, most rice was produced in a belt extending along the western coast northward from the 38th parallel. On the Haeju peninsula, South Pyongan and Hwanghae provinces, given sufficient irrigation and normal rainfall, annually planted some 422,000 acres and produced approximately 283,162 tons of rice. A substantial portion of the irrigation water required to produce the Haeju rice crop was impounded behind earth and stone dams in only 20 reservoirs. The dikes of these reservoirs were vulnerable to air attack, and when they were breached a number of positive results would be obtained. The Reds would be denied the irrigation waters they needed for rice production. The released flood waters would destroy a year's rice planting in the lowlands, they would silt over or wash away valuable topsoil, and they would cause increased fertilizer demands since the leached soils would have to be rejuvenated. In several instances, moreover, the released floodwaters would destroy or damage Communist military installations, lines of communications, and airfields. Japanese horticulturists explained that there were two particularly critical periods in the rice grow-

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ing season: the first was in early May, at the end of the transplanting season, when flood waters would uproot or cover the young plants; the second was in early August, during the blooming season, when flood waters would destroy a large portion of the plants and thus the year's crop. After a May destruction the farmers could possibly replant, but attacks in this month would be materially and psychologically damaging. Moreover, attacks could be made in May and repeated in August if this proved to be necessary.²¹⁹

The North Korean agricultural irrigation dams (see figure 13) provided an excellent air target system, which, if destroyed, would have had a shattering effect on the economy of the Soviet bloc. But the implications of air attacks against this system appeared too drastic. On 24 March 1953 the FEAF air targets representative first broached the subject of attacks on irrigation dams at a meeting of the FEAF Formal Target Committee. After explaining the significance of the reservoirs, he asked the Fifth Air Force and Bomber Command to explore the possibility of breaching all 20 reservoirs in the Haeju area simultaneously.²²⁰ Pending this further study the FEAF Formal Target Committee made no recommendations on the matter, but when General Weyland was briefed on the proposed operations he was reportedly "skeptical of the feasibility and desirability of destroying the North Korean rice irrigation system."²²¹ On 7 April, moreover, several members of the FEAF Formal Target Committee expressed doubt as to the wisdom of such a drastic operation. The committee therefore recommended that the FEAF Deputy for Intelligence should prepare a presentation of facts for General Weyland's use either in making a decision on the matter or a recommendation to higher headquarters.²²²

The FEAF intelligence study that resulted emphasized the positive effects of the irrigation dam attacks which have already been noted, and it devoted equal attention to the potentially negative features of such operations. A major deterrent was that section of CINCFE's instructions to General Weyland which ordered that: "Every effort will be made to attack military targets only, and to avoid needless civilian casualties." Assuming that any activity in support of the Communist armed forces or the North Korean government was a military target, the enemy's rice crop and

irrigation reservoirs were obviously military targets. The reservoirs, moreover, were in rural areas where there was small chance that air attacks would inflict needless civilian casualties. The Communists would undoubtedly put out propaganda that the UNC was denying food to women, children, and babies, but actually most of North Korea's rice production was going into military or international barter channels and little of it got to the civilian population. If the dams were destroyed in May the farmers would have time to plant another crop, and they would tend to blame the Red regime for their trouble. As for the feasibility of destroying the dams, the intelligence study believed (pending exact targeting) that the dams could be breached by upstream underwater blasts of conventional large-size bombs available in the theater. So far as FEAF intelligence could determine, attacks on the agricultural reservoir system of the Haeju peninsula would be suitable, feasible, and acceptable.²²³

The agricultural irrigation target system had been identified at a time when the armistice negotiations were being resumed, and neither General Clark nor General Weyland thought that the time was opportune for such a drastic operation as the destruction of the enemy's rice crop. Both believed, however, that the rice destruction operation would have utility as an ultimate in air pressure, to be used if the Communists broke off armistice negotiations. Had the situation been different, General Weyland wrote later, with specific reference to the irrigation dams, the policy of attacking only targets directly related to the military structure and its support might have been completely invalid.²²⁴ While he was unwilling to authorize attacks against the rice crop, General Weyland knew no hesitancy in approving irrigation dam attacks where resulting flood waters would interdict hostile lines of communication.

About 20 miles north of Pyongyang and backing up waters of the Potong River into a three-mile long and one-mile wide reservoir, the Toksan irrigation dam loomed over the main Sinanju to Pyongyang ("George") rail line and dominated a main north-south highway as well. In order both to develop dam destruction techniques and to interdict the "George" rail line, General Weyland directed the Fifth Air Force to breach the Toksan dam. On 13 May four waves of 59 F-84 Thunderjets of the 58th Fighter-Bomber Wing attacked

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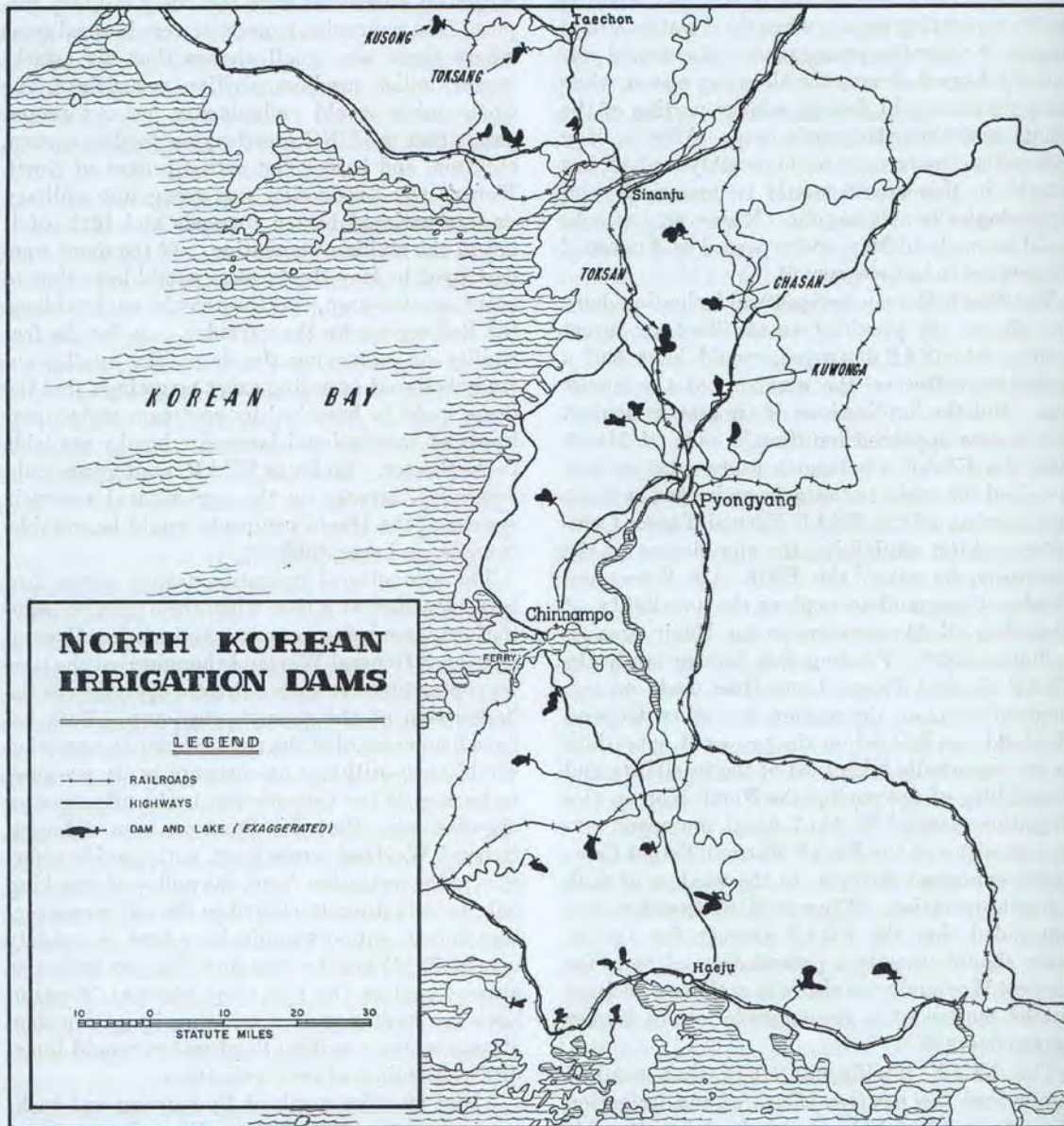


Figure 13.

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the 2,300-foot-long dam. In this pioneer effort, the first two waves, each of four aircraft, launched their 1,000-pound bombs from 300 feet altitude: the first four aircraft skipped their bombs into the face of the dam while the second four attacked the water side of the dam. A third wave of 12 aircraft attacked along the length of the dam, and late in the afternoon the fourth wave sought to destroy the dam by the hydraulic pressure of bombs dropped in the water near it. At last light on 13 May water was seeping down the dam's face from two craters on the top, but the dam was still intact. Sometime that night the impounded waters of the reservoir broke through the weakened dam, and when the fighter-bomber pilots returned to continue the attack on the morning of 14 May they found the reservoir empty.²²⁵

"The breaching of the Toksan Dam," General Clark jubilantly informed the JCS, "has been as effective as weeks of rail interdiction."²²⁶ Photography showed that the results of the raging flood released at Toksan had been indeed fearful. Approximately six miles of the "George" rail line and five bridges had been destroyed or damaged. Some two miles of the main north-south highway, including five bridges, were either damaged or destroyed. Down the river valley 700 buildings were destroyed and 877 damaged. Sunan airfield, some seven miles south of the dam, was flooded, as were eight occupied anti-aircraft artillery positions and an unidentified underground installation. The swirling floodwaters also scoured some five square miles of crop lands and washed out their web-like irrigation canals.²²⁷ "The damage done by the deluge," said the Fifth Air Force directorate of operations, "far exceeded the hopes of everyone."²²⁸

Having made one of the two main rail lines into Pyongyang unserviceable, FEAF immediately scheduled two more dams for destruction which would immobilize the "Fox" rail line. Chasan dam was assigned to the Fifth Air Force and the Kuwonga dam to Bomber Command. Fifth Air Force fighter-bombers got to work immediately. Late on the afternoon of 15 May, 36 Thunderjets of the 58th Wing, each carrying 2 x 1,000-pound general purpose bombs, dive-bombed the Chasan dam but inflicted no significant damage. On 16 May three waves of 90 Thunderjets from the 58th and 474th Wings continued the dive-bombing attack, and the last attack of the day inflicted five

direct hits in a pinpoint area to open a break which was pounded out by the hydraulic pressure of other bomb hits in the water just beyond the dam. Within four hours the impounded waters of the one and one-half mile long and one-mile wide reservoir poured through a 150-foot breach and surged southward to wash away some 3,050 feet of rails, 2,050 feet of embankment, and three railway bridges of the "Fox" line. Although the main "Purple-5" road suffered slight damages, 1,500 feet of secondary road was washed out and 53 buildings and 16 supply shelters were destroyed. The onrushing waters surged over field after field of young rice.²²⁹

When seven Bomber Command B-29's attacked the Kuwonga dam on the night of 21/22 May, their results with 2,000-pound bombs were less positive than those which had been scored by the fighter-bombers. This dam was earth-filled with stone facings, 290 feet long, 75 feet high, and 25 feet wide at its crest. Out of 56 bombs dropped by shoran aiming, four direct hits battered the crest of the dam, but there were no breaks. Now fully cognizant of the dangers posed by the dam attacks, the enemy reacted almost immediately and reduced the water level in the Kuwonga reservoir by 12 feet, thus increasing the thickness of the earth which had to be breached to some 90 feet. Again, on the night of 29 May, 14 B-29's attacked the dam with 2,000-pound bombs, and five direct hits tore out a crater 46 feet wide by 190 feet long. Had the water level in the reservoir been at its customary height, this attack would have doubtlessly breached the dam.²³⁰ Although these two B-29 missions failed to secure the desired flood, they must have damaged the inner core of the dam. Before they could begin to rehabilitate the structure, the Communists were compelled completely to drain the Kuwonga reservoir.²³¹

Even though the Communists displayed their usual fantastic rapidity in restoring destroyed and damaged rail lines to serviceability, the "Fox" and "George" rail lines had been so badly swamped that they were not usable until 26 May.²³² This experience demonstrated that the irrigation dams were valid as interdiction objectives. Early in June, moreover, General Weyland perceived that the flood waters of these dams might have an additional utility. At this time he was quite anxious lest the Communists get some air units into Korea just prior to the effective hour of the armis-

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tice.* Two major Red airfields at Namsi and Taechon had been bombed and were scheduled for continuing attack, but it was still possible that the Communists, benefiting from a period of bad weather, might make enough repairs so that these fields could receive MIG-15 fighters. General Weyland therefore asked permission to bomb and breach the Kusong and Toksang irrigation dams, whose impounded waters would flood these two airfields, wash out "Jig" rail line between Kusong and Chongju and damage the new "Jig-1" rail line between Kusong and Kunuri. On 11 June CINCUNC recommended that the attacks be made, and the JCS concurred in the proposal that same day.²³³

The Fifth Air Force began the attacks against Kusong and Toksang on 13 June. During that day 54 F-84's attacked Kusong and 40 F-84's struck Toksang, and the tactics employed against each objective were the same. Each force was divided into two waves, the first of which skip-bombed the center of each dam from the water side with 1,000-pound bombs and the second of which launched its bombs in the same manner but followed a reciprocal course to strike the face of the dam. On 14 June, 40 F-84's and 16 F-86 fighter-bombers reattacked Toksang, while 20 F-84's and 20 F-86's reattacked Kusong. That night 20 B-29's were scheduled against the two dams: the Kusong mission was scrubbed in favor of front-line support but the other 10 Superforts attacked Toksang with 1,000-pound bombs. Weather, which now began to deteriorate, prevented attacks against these dams on 15 June, and during this day of respite Communist forced labor battalions refilled a number of craters on both dams. On 16 June eight F-84's and 16 Marine Corsairs came close to breaching Kusong when three of their bombs cut across the crest of the dam, leaving only two crater ridges to hold back the water. The Communists responded to this threat by opening Kusong's floodgates and draining the reservoir. On 18 June eight F-84's and 16 Corsairs attacked Toksang, and that night 16 B-29's bombed it with 2,000-pound bombs. These cumulative strikes demolished the western end of the dam, but the Communists had been lowering the water level with each attack just enough to avert a breach and finally they completely drained the reservoir.

*See pp. 135-39.

Without the force of impounded water further attacks against Toksang and Kusong would obviously be fruitless, and such strikes were discontinued in favor of direct attacks against Namsi and Taechon airfields.²³⁴

In the course of Korean hostilities, FEAF's operational planning was often short range and lacking the detailed analyses which are required in a major war. Such short-range planning not infrequently gave scant consideration to potential enemy reactions to planned air operations.† Planning for the irrigation dam attacks had included an excellent estimate of obtainable results, but it had failed to consider the enemy's possible course of action in opposition to such attacks.²³⁵ Failure to anticipate that the enemy could drain the Kuwonga, Toksang, and Kusong reservoirs, thus reducing the vulnerability of their dams to air attack, prevented FEAF from realizing the exact results which it desired. In some measure, however, the fault here lay not in planning but in the change from original planning: FEAF intelligence had originally urged that 20 selected dams should be breached in as short a time as possible, thus allowing the enemy little time in which to react and maximizing the shock effect of the attacks, but instead the strikes had been scheduled against individual targets over a time interval of several weeks. The Communists had been given adequate time in which to devise and disseminate countermeasures. These countermeasures prevented flood damages, but so far as rice production was concerned they were ill-advised: by draining their own reservoirs the Communists deprived themselves of the large quantities of irrigation water which they required in a very critical period of the rice farming cycle.²³⁶ After Toksang and Kusong FEAF made no more irrigation reservoir attacks, but General Weyland kept an overall attack plan against this complex in mind just in case it might be needed as an ultimate punishment for the Communists.²³⁷

At the end of the Korean fighting, General Weyland remarked that two particular fighter-bomber strikes stood out in his mind as "spectacular on their own merit." One was the hydroelectric attacks of June 1952 and the other—"perhaps the most spectacular of the war"—was the breaching of the Toksan and Chasan dams in

†See also AHS-72, p. 155.

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May 1953.²³⁸ To the average Oriental an empty rice bowl is symbolic of starvation, and the vitriolic propaganda indictments made against the United States immediately following the destruction of these two dams showed that the Communists were deeply impressed. Vengeful propaganda broadcasts gave the impression that dozens of irrigation dams and the entire Korean rice crop had been destroyed, the obvious propaganda goal being to mobilize world opinion against any additional reservoir attacks. Fully realizing what air attacks on the other dams would mean, Communist propagandists used every trick in their trade to forestall them. Heavily stressed was the charge that the dams "were not military targets" and that, in destroying them, "the Americans were trying to spoil the vast fertile soil and drown several scores of thousands of farmers." Some indication of the enemy's desperate straits was also shown in the vigor with which he approached the task of restoring the vital dams and washed-out rail lines, highways, and bridges. UNC air observations showed that over 4,000 laborers were immediately dispatched to Toksan, where work was carried on around the clock with little regard for delayed-action bombs strewn about in the area. In a prideful, postwar broadcast Radio Peking said that 200,000 man days were required to close the gap in the Toksan dam. Since this task was not accomplished until 14 August, rice production on the 7,500 acres said to have been normally irrigated from Toksan's waters must have been quite limited. A CCRAK agent who had been in the area at the time of the attack said that the local population felt that this had been the greatest damage caused by any single UNC air attack.²³⁹ Compounded 20 or 30 times such damages as were inflicted at Toksan would have been disastrous to the Communist cause in Korea, and the Reds, recognizing their precarious situation, were not going to argue much longer about the disposition of the prisoners of war.

Air Attacks Against Sensitive Targets: Since 16 December 1952, when the target had been initially assigned to Bomber Command, both FEAF and the FEC had been keenly interested in the destruction of Radio Pyongyang. The target, however, was a most difficult one: it was located in several concrete-reinforced caves near Pyongyang and was about 42 feet below ground. The radio station itself was a pinpoint target, and, to make matters

worse, some buildings only 750 feet northwest of it had at one time been marked as a UNC prisoner of war camp. Bomber Command did not foresee much success in a mission against such an objective since its 2,000-pound general purpose bombs, even when fuzed for maximum penetration, would only reach a depth of approximately 30 feet, but on the night of 17 January 1953 it had put 11 B-29's over the objective. These planes scored 15 hits in the target area, but the transmitter did not go off the air. After this there was some thought that the target might be worthwhile for a few 12,000-pound Tarzon bombs which remained in the theater, but FEAF had no airplanes suitably modified to carry these large missiles and this project was obviously too costly. On 15 February, however, the Pyongyang Radio went off the air at a time when B-29's were striking the nearby Pingjang-ni communications center, and strike photography revealed that power lines leading from the area had been damaged. FEAF therefore suggested that the Fifth Air Force examine the possibility of denying electric power to the Pyongyang Radio.²⁴⁰

While there was very little possibility that the destruction of power lines would keep Radio Pyongyang off the air for anything more than a short time, the Fifth Air Force decided to exploit a psychological attack against this broadcasting station. On 1 May it accordingly devised a surprise package designed to dampen the enemy's May Day festivities and to disrupt his propaganda broadcasts, which would be at a peak on this Communist holiday. Although the radio station was in one of the most heavily defended areas in North Korea, General Barcus took advantage of the tactical flexibility permitted by his new F-86F fighter-bombers. While the 4th and 51st Wings screened off the area, General Barcus personally served as airborne commander as other 8th and 18th Wing Sabre fighter-bombers flew at high altitude as if proceeding to the Chongchon or the Yalu for a sweep, made a sudden letdown at an initial point, dived into the target area, released their bombs, and then swept away on the deck until they were out of the range of the flak batteries. Only one aircraft sustained major damage, and its pilot brought it safely home to K-13. After this mission and while he was still hovering above Pyongyang, General Barcus broadcast on a frequency known to be monitored by the Reds his

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promise that: "We will be back every time you broadcast filthy lies about the Fifth Air Force." Although this daring attack against a heavily defended target represented a loss of face to the Reds,* it was not successful in silencing the Pyongyang radio.²⁴¹

Beginning in May 1953 FEAF also initiated a program designed to insure that such rehabilitation effort as the Reds had expended on their hydroelectric generating facilities would be nullified prior to a truce in Korea. On 2 May, General Weyland accordingly asked permission to undo Red repair efforts at Sui-ho. CINCUNC initially replied that the state of the truce talks was not right for such attacks, but within a few days he changed his mind and informed the JCS that Sui-ho would be attacked unless they specifically disapproved. The JCS gave approval on 8 May, and on 10 May eight 474th Fighter-Bomber Group F-84's went in low under heavy Sabre cover and put at least three delayed action bombs through the roof of Sui-ho's power house. Although none of these planes were lost, one of the pilots on the mission said that the flak was "the most intense in all of North Korea."²⁴² Tailrace activity continued at Sui-ho, indicating that at least two generator turbines must be working. On 30 May General Weyland therefore asked CINCUNC to grant a blanket authority whereby FEAF would continue to attack this target as often as necessary to put it out of business, but, while CINCUNC was willing to approve another attack, he was unwilling to grant this authority for continuing attacks against a sensitive target.²⁴³ Quite cognizant of the heavy flak defenses at Sui-ho, the Fifth Air Force now exploited the surprise possible with an all-Sabre attack: according to a carefully coordinated operations plan, the 4th and 51st Fighter-Interceptor Wings on 7 June provided 66 Sabres for a Yalu and backup patrol while eight F-86F fighter-bombers of the 8th Wing, flew integral formation with 12 other 51st Wing Sabres to a proper point over Sui-ho, where they dropped out of formation and rolled into their bomb run. Since the Sabres often used Sui-ho as a checkpoint in their patrols, the eight Sabre fighter-bombers got down to the target so quickly that the Red gunners were not alerted. These Sabres scored a number of hits on the northern quarter of the

*See Chap. III, p. 57.

Sui-ho generator house (where the two operational generators were believed to be located) and then swept away on the deck, unscathed by enemy ground fire.²⁴⁴ Cloud cover on reconnaissance photography obscured the exact results obtained by the 1,000-pound semi-armor-piercing bombs which the Sabres dropped, but for several days there was no tailrace turbulence. Subsequent photography, however, revealed that the tailraces of what should have been No. 6 and No. 7 turbines had started up again, and the photographic interpreters once again had to assume that Sui-ho plant had been repaired enough for some limited production. Until target experts could establish the exact location of the generators in the long, narrow, bomb-resistant powerhouse, there was not much sense in risking pilot's lives at Sui-ho. Shortly before the end of hostilities, Fifth Air Force intelligence was trying to get some indigenous agents into the area at Sui-ho to try to find out what was going on under the roof of the reinforced-concrete powerhouse.²⁴⁵

Just to be on the safe side and to be sure that the North Korean hydroelectric facilities were freshly bombed before the end of hostilities FEAF desired in June 1953 to schedule some attacks against the Kyosen and Fusen facilities. Due to demands for air support of ground operations, however, these strikes were delayed, and in July CINCUNC was hesitant to approve them lest they complicate armistice negotiations.²⁴⁶ But as hostilities ended a last minute reconnaissance of the enemy's hydroelectric facilities revealed that nearly all of them were out of operation. Only two of the power plants were in a partially serviceable condition: Sui-ho with possible serviceability of two turbines and Chosen No. 1, which had one generator that was possibly serviceable. The three Chosen, four Fusen, and four Kyosen power plants were unserviceable.²⁴⁷

Complying with CINCUNC's standing instructions that he be notified prior to any air attacks against sensitive areas, General Weyland on 11 April expressed the intention of attacking a target complex at Yangsi with B-29's on the night of 15/16 April. This complex of buildings, warehouses, and barracks was located 12 miles southeast of Sinuiju. It was adjacent to the main Antung to Sinanju railway and was bisected by a main north-south highway. This target looked lucrative to Bomber Command, whose intelligence

officers had developed it, and it met General Weyland's requirement for continuing B-29 activity in the Sinuiju area. CINCUNC authorized the attack and so informed the JCS, but this body, pointing out that one of the LITTLE SWITCH convoys was supposed to move through the area, desired the attack postponed.²⁴⁸ On 1 May CINCUNC advised the JCS that, following the exchange of the sick and wounded prisoners of war, he intended to permit a FEAF attack against the Yangsi complex on the night of 10/11 May.²⁴⁹ On this night, 39 B-29's attacked Yangsi without great difficulty and effected 63 percent destruction of the complex, or a total of 652 buildings. On the night of 18/19 May, 18 B-29's went back to Yangsi, this time to destroy 166 buildings in the barracks area which were used for the storage of highly critical war materials. These actions completed the practicable destruction of "one of the last large lucrative targets remaining in North Korea."²⁵⁰

After finding Yangsi, Bomber Command had requested photographic surveillance of the entire main supply route between Sinanju and Sinuiju in the hope of discovering other lucrative complexes. Apparently this reconnaissance turned up a good number of worthwhile targets which were far enough north for their destruction to be impressive to the Communists and not so far north as to be "sensitive" and thus require a CINCUNC clearance for attack. Bomber Command attacked as many of these complexes as it could manage. On the night of 19/20 May, 14 B-29's destroyed a total of 117 buildings in the Unsan-Dong complex, about eight miles due west of Sinanju and probably used by the Reds both for billeting coastal defense troops and as a stopover point for motor transports. On the night of 7/8 June, 14 B-29's attacked the Unhyang-po supply area, located about 20 miles southeast of Sinuiju. This area contained fuel storage, a large supply dump, and warehouses, and it was apparently used as a transshipment depot and a refueling stop for trucks. The bombers destroyed 250 buildings, or more than half of the structures in the complex.²⁵¹ In this same XE grid area, Bomber Command targeted for attack two more significant installations—a factory complex at Yongpong-dong and a storage and transshipment point at Yongampo—but the requirements in June for close support of friendly ground troops used up the medium

bomber capability. Early in July, FEAF got CINCFE to clear attacks against Yongpong-dong and Yongampo, both of which were in the sensitive zone, but once again the medium bomber effort had to be diverted to ground support. Had the war continued, Bomber Command would have attacked these two targets early in August.²⁵²

Interdiction of Communist Ground Forces: Although the resurgent Communist ground offensives of May, June, and July 1953 at once demanded and rewarded destructive interdiction operations, relatively fewer sorties could be flown against hostile personnel, transportation, and supplies because of the increased requirements for close support of friendly ground troops. Thus in May 25 percent, in June 49 percent, and in July 43 percent of the total FEAF combat effort was expended in close-support missions.²⁵³ During the course of his offensives, however, the enemy once again had to expose troops and vehicles to air attack, and at such times as it felt that the ground situation permitted it to do so FEAF continued to emphasize air pressure operations against Communist buildups to the rear of the ground battle line.

During the period of the LITTLE SWITCH prisoner exchanges, General Weyland accepted some "temporary loss of effectiveness of air operations against normal Communist troop and supply movements" but he nevertheless directed the Fifth Air Force to intensify its armed reconnaissance missions to insure that the Communists did not take undue advantage of the POW convoys to ship troops and supplies to the front. As Weyland had expected, the Communists displayed a reluctance to divulge the details of the prisoner convoy movements, but the Fifth Air Force aerial surveillance effort revealed no definite indication that traffic over the agreed convoy routes was other than normal.²⁵⁴ During May and June, as the nights got shorter and Communist ground effort increased, the Fifth Air Force maintained a continual daylight reconnaissance over the area from the bomblines northward to the chief Pyongyang to Wonsan "Green" main supply routes. Direct communications between aircraft of the 67th Tactical Reconnaissance Wing and fighter-bombers on armed reconnaissance were emphasized, with the result that as little as three minutes delay frequently elapsed between the time of discovery of enemy day movements to the time of fighter-

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bomber attack.²⁵⁵ Daylight sightings continued to be relatively small, with the exception of 16 June when the enemy, probably needing supplies to support a flareup of fighting in the Kumhwa-Chorwon area, took a chance and exposed a convoy to air attack. This proved to be a costly choice for out of 500 odd vehicles sighted by Fifth Air Force fighter-bombers, 312 were brought under attack, with the result that 56 of them were destroyed and nearly 100 damaged.²⁵⁶

During May and June, when CINCUNC was apprehensive that a Red ground attack would be launched in western Korea against the I and IX Corps, FEAF aircraft maintained steady pressure against enemy personnel, supplies, and transportation routes in northwestern Korea. Fighter-bombers flew strikes to cut rail bridges on the northwestern rail routes, and additionally released the impounded waters of the Toksan and Chasan dams to flood the rail routes into Pyongyang.²⁵⁷ Both Bomber Command and the Fifth Air Force gave attention to supply areas and troop billets. In May the B-29's flew 35 strikes against such targets, and in June they bombed 12 of these objectives. Both Fifth Air Force fighter-bombers and light bombers gave increased attention to attacks against supply and personnel areas, concentrating the area of their attack towards the western end of the ground battle line. Marking increased emphasis on this mode of attack, the light bombers in May flew 15 bomber stream attacks against targets consisting mainly of airfields and troop concentration areas. During May the 17th Bombardment Wing, which had been designated to recapture a shoran capability, utilized this method of air attack in a consistent effort which in June was applied to marshalling yard targets. The light bombers also were utilized when necessary in concentrated daytime attacks: thus on 15 June, 37 aircraft from the 3d Wing and 24 aircraft from the 17th Wing flew group formation daylight strikes against a large troop concentration area in front of the II ROK Corps area. This strike was called "successful," but the B-26's suffered five major damages and 24 minor damages from intense and accurate enemy flak.²⁵⁸

Required to fly ground support missions when inclement weather along the battle line precluded normal fighter-bomber close-support strikes, the B-26 light bombers had a reduced capability for

night intruder missions during May and June. Out of 1,775 sorties flown by the light bombers in May, only 858 were armed reconnaissance sorties along the MSR network of North Korea; and out of a total of 2,300 sorties flown in June, only 569 were armed reconnaissance sorties against vehicular supply routes and 71 were rail reconnaissance sorties. Although the fewer intruder sorties flown inevitably reduced the total destructions of enemy vehicles, the two light bomber wings claimed 2,239 destroyed in May and 1,029 in June. Nine locomotives were claimed destroyed in May and six in June. The only new tactical employment attempted in the night intruder work was a use in the 3d Wing of proximity-fuzed 260-pound fragmentation bombs for attacking vehicles. The wing reported an increased effectiveness with this ordnance but because this loading reduced the number of available bomb drops per sortie the Fifth Air Force did not favor the practice. Although the Fifth Air Force noted that the proximity-fuzed frag bombs were effective in silencing hostile automatic weapons positions near the MSR's and enabled the intruder crews to make better bomb runs against vehicular traffic, it still considered M1A2 frag clusters to be the basic ordnance loading for night intruder operations against vehicular traffic in Korea.²⁵⁹

While little effort was made to coordinate these various interdiction attacks during May and June, the Fifth Air Force had neither lost its interest in the Chongchon estuary bridges nor given up its belief that concerted FEAF attacks made against this potential bottleneck would successfully tie up Communist rail traffic in northwestern Korea. At a meeting of the FEAF Formal Target Committee on 23 June the Fifth Air Force representatives therefore proposed that the medium bombers should attack the Sinanju rail crossings about once every three days, with a view toward keeping these bridges out of operation for an appreciable period of time. The Fifth Air Force would simultaneously schedule attacks against the Yongmi-dong rail bridges, and its night-flying day fighters and light bombers would harass Red repair activities at both Sinanju and Yongmi-dong. Bomber Command agreed to institute the desired attacks early in July, when the moon phase would be favorable to sustained operations in this area.²⁶⁰ The Fifth Air Force also asked Task Force 77 to schedule rail

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bridge attacks against the "Roger," "King," and "Item" lines which lay behind the eastern side of the ground front.²⁶¹

Poor to marginal weather resultant from the beginning of the summer rains delayed the initiation of the Chongchon estuary attacks and had both positive and negative effects on the operations once they were begun. Beginning on the night of 10/11 July, 16 Superforts of the 98th Wing attacked the Sinanju bridges and on the following night the same number of 307th Wing medium bombers attacked at Yongmi-dong. Fifth Air Force fighter-bombers cleaned up the bridges which remained at both complexes, but on 11 and 12 July they placed most of their effort against highway bridges crossing the Chongchon all the way up its course from Sinanju to Huichon. After the first two nights, the B-29's were either diverted to ground support or else had to give attention to priority airfield targets and did not return to the bridge targets, but the Fifth Air Force, although weathered out on 13, 14, and 15 July, returned to renew the attack on the Sinanju to Huichon bridges on 16 through 20 July. Night-flying day fighters harassed the bridge repairs as often as the weather permitted, while other fighter-bomber attacks against bridge-span assembly points in Huichon and Sunchon further impeded the repair of the bridges. Although summer rains prevented followup attacks against rail stock backups on the rail lines adjacent to the Chongchon bridges, these same rains swelled the river and undoubtedly hampered Communist repair efforts. The combined effect of the concerted destruction, continued harassment, and the flooded river made for an extremely effective and long lasting interdiction of the key Chongchon estuary bridges. As of 22 July the bridges were still unserviceable, blocking all through traffic via the "Able" and "Baker" lines into Pyongyang. On the last photography flown prior to the military armistice, three bridges were still unserviceable and one not observed at Sinanju, and six bridges were unserviceable and one was serviceable at Yongmi-dong.²⁶² Against eastern front railways, Task Force 77 initiated limited-scale interdiction against selected railroad bridges commencing on 10 July, but it reported that adverse weather made the results of this effort rather unimpressive and prevented sustained interference with the flow of enemy supplies.²⁶³

During July armed reconnaissance, flown both by day and by night, was greatly hampered by the generally poor flying weather. Although the enemy permitted day sightings of 1,620 of his vehicles, mostly in small groups in the area where the II ROK Corps was under attack, the fighter-bombers were able to claim only 46 of these vehicles as destroyed.²⁶⁴ Out of a total of 2,119 combat sorties, the two B-26 wings were able to fly only 453 armed reconnaissance sorties over the enemy's main supply routes. These sorties, however, were apparently quite efficient for 20 percent and 26 percent of the vehicles attacked by the 3d and 17th Wings were claimed as destroyed. As a result of this efficiency in operations, the two wings claimed the destruction of 1,379 enemy vehicles during July. Although greatly increased enemy rail activity was observed during the month, marginal to nonoperational weather allowed only 37 rail reconnaissance missions and only one locomotive was claimed as destroyed.²⁶⁵

Neutralization of North Korean Airfields: After it had established air superiority over North Korea in the initial weeks of hostilities, FEAF had been able without too much difficulty to thwart each Red effort to reconstitute an air force in the area. "The airfield neutralization program in North Korea," stated a FEAF intelligence report, "was like shooting sitting ducks."²⁶⁶ Since the Communists, using an immense quantity of coolie labor, could always repair a runway within a few days, the time required for the task being in no way proportionate to the number of bomb craters, FEAF found it most advisable to employ timely and modest air attacks, scheduled as often as photographic surveillance showed that an airfield was almost ready for use. Although FEAF assigned to the Fifth Air Force the general responsibility for keeping the North Korean air facilities neutralized, the FEAF Formal Target Committee usually coordinated attacks against these facilities, and the actual attack against airfields were made as necessary by aircraft of the Fifth Air Force, Bomber Command, and Task Force 77.²⁶⁷

After November 1951 the Communists, evidently recognizing that they could not use airfields in an area dominated by UNC air superiority, made little observable effort to rehabilitate North Korean air facilities, but they continued to do just enough work to keep the fields in a condition which would permit rapid repairs just before the

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conclusion of a military armistice. They demonstrated some interest in keeping the airfields at Uiju and Sinuiju operational, both of these fields being just across the Yalu from Antung. On the night of 28 November 1952, when its B-29's were sent on a maximum effort strike against a number of targets in the Sinuiju area, Bomber Command used a few planes against the airfields at Sinuiju and Uiju. Subsequent photo cover showed that the Reds had repaired Uiju by 4 December and Sinuiju was considered serviceable on 26 December. During December 1952 the Communists also repaired Pyongyang Main airfield well enough to sustain light aircraft operations; in the following few months this airfield was thrice attacked by B-29's and thrice repaired by the Communists.²⁶⁸

Communist activities at the North Korean airfields were negligible until the end of March 1953, but during April Fifth Air Force reconnaissance planes noted a marked increase of Communist repair efforts at many fields: runways were being repaired at Sinnak, Haeju, Pyongyang East, and Hamhung West, all of which had been heavily cratered and had been long out of use. Other repairs were gotten underway at Namsi, Taechon, and Pyongyang Main. This effort was quite obviously keyed to the truce negotiations: although the matter remained tentative, a broad agreement had been reached in the negotiations to the effect that during a military armistice neither side would be able to bring into Korea any military equipment except as replacements for items which were destroyed, damaged, worn out, or used up. The Communists now evidently assumed that the truce negotiations were going to succeed. To get ready for the armistice they intended to repair as many airfields in North Korea as possible and then, in the last hours before the truce took effect, to rush in a maximum number of aircraft, thus establishing an air order of battle in North Korea when the armistice became effective.²⁶⁹

Correctly assessing the Communist intentions, General Weyland on 3 May 1953 listed 30 North Korean airfields which had to be kept unserviceable; he assigned 9 of these airfields to Bomber Command, 15 to the Fifth Air Force, and asked NAVFE to assume responsibility for 6 of the fields. A few other airfields would be added to the list, so that in all 35 fields would require continuous surveillance and neutralization when appropriate. The desired degree of neutralization

was that which would keep all usable runway surfaces shorter than the 3,000 feet required for landing a MIG-15 fighter. Listed by FEAF priority and command responsibility, the airfields were as follows (see figure 14):

FEAF Priority	Responsible Command	Target Airfield
1	FEAF Bomber Command.	Uiju
2	do	Sinuiju
2A	do	Sinuiju NE
3	do	Namsi
4	do	Taechon
5	do	Pyongyang Main
6	do	Pyongyang East
7	do	Saamcham
8	do	Pyongyang Down-town
9	do	Sinanju
	do	Pyongyang South
10	Fifth Air Force	Pyong-ni
11	do	Sunan No. 2
12	do	Hwangju
13	do	Kandong
14	do	Onjong-ni
15	do	Sinnak
16	do	Anak
18	do	Yongyu No. 2
23	do	Yongdang-dong
24	do	Haeju
25	do	Onjin
26	do	Sariwon No. 2
28	do	Pyongyang
29	do	Kanggye No. 2
30	do	Chunggangjin
17	NAVFE	Chongjin
19	do	Sondok
20	do	Wonsan
21	do	Yonpo
22	do	Hamhung West
27	do	Hoemun
	do	Hoeryong
	do	Hyesanjin
	do	Kilchu

Because the Communists had demonstrated a capability to repair airfields very rapidly, the success of this joint airfield attack program would hinge on an accurate forecasting of the time at which the armistice was going to be signed.²⁷⁰ The six airfields near the Korean border—especially the fields at Sinuiju and Uiju and to a lesser extent the fields at Hoeryong, Chunggangjin, and Hyesanjin—were particularly important, and since these airfields were “sensitive” targets CINCFE would normally be expected to give the JCS 48 hours’ advance notice before attacking them. Fearing that this advance notice period might hamper the

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Figure 14.

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neutralization of these critical airfields, General Weyland requested that he be given a blanket authority to attack them when an armistice became imminent. CINCFE replied on 21 May that the 48-hour advance notice for these airfields would be automatically waived when he notified FEAF that an armistice was imminent.²⁷¹

Only a part of these airfields specified for surveillance and attack were capable of operational usage, but the fields that were being repaired by the Communists drew preliminary neutralization strikes. Task Force 77 had little need to attack its share of the airfields since the enemy appeared to be making no repair efforts on them.²⁷² Only four of the fields assigned to the Fifth Air Force appeared anywhere near serviceable and these were scheduled for routine attack.²⁷³ Bomber Command had heavier activity: on 18 and 20 April it had already bombed the concrete runways which were being repaired at Namsi and Taechon, on 3 May it attacked both Pyongyang Main and East airfields, and on 13 May it again cratered the runway at Namsi.²⁷⁴ These routine airfield attacks retarded the Communist repair efforts.

Early in June 1953, however, the armistice negotiations appeared to be moving rapidly toward the achievement of a cease-fire agreement. Acting on the assumption that an armistice was imminent, General Weyland on 8 June secured permission to attack Sinuiju and Uiju airfields on the night of 10/11 June, and on 10 June General Clark gave Weyland a blanket authority to implement the joint airfield neutralization program. Begun promptly that same day, the airfield neutralization strikes went off much as had been planned. Bomber Command made night attacks against Uiju and Sinuiju on 10 June, Namsi on 11 June, Pyongyang Main on 12 June, Saamcham and Sinanju on 13 June, Pyongyang Main on 15 June, Saamcham on 18 June, Pyongyang Main on 19 June, Uiju and Sinuiju on 20 June, Namsi and Taechon on 21 June, and Pyongyang Main on 22 June.²⁷⁵ Initially hamstrung by bad weather, Task Force 77 did not begin its attacks until 13 June but that day 117 sorties cratered the runways at Hoemun-dong, Hoeryong, Chongjin, and Wonsan, and next day 95 sorties attacked Sondok, Hoeryong, Hyesanjin, Chongjin, and Wonsan. At mid-June these airfields and also Hamhung West, Yonpo, and Kilchu were all unserviceable.²⁷⁶ Simultaneously Fifth Air Force fighter-bombers

and shoran-bombing B-26's attacked such airfields on its list as were possibly serviceable, and by 23 June all 24 airfields not totally unserviceable already had been hit at least once. With the possible exception of Hoeryong, which had been repaired sufficiently during bad weather for light planes to land, FEAF thought it doubtful on 23 June that there was a single airfield in North Korea which could service tactical aircraft.²⁷⁷

The joint airfield attack program had been implemented on 10 June in the belief that an armistice was in the immediate offing, but there was to be no truce for more than a month. As the prospects for an armistice diminished the joint airfield attacks slackened off, and on 23 June General Weyland advised all commands to return to normal operations and to attack the airfields only as often as the situation required. On 29 June he advised NAVFE, Bomber Command, and Fifth Air Force that attacks against the Communist-held airfields would again be given first priority when an armistice appeared imminent. Meanwhile, he suggested that all commands should maintain surveillance and fly such followup strikes as would permit them to render the airfields unserviceable within a period of four to five days under adverse operating conditions.²⁷⁸

What progress the Communists were making in rehabilitating their North Korean airfields in the first half of July was vague: on a series of successive days summer cloud cover held UNC aerial reconnaissance to the barest minimum. During this period of adverse weather, Bomber Command's shoran-directed medium bombers made several attacks in order to keep in step with whatever progress the Reds might be making: Pyongyang Main airfield, where the Reds had demonstrated great prowess in repairing the damages wrought by 100-pound bombs and which was accepted as one of the points from which enemy night heckler attacks were being flown, was blasted out of an operational category with 500-pound bombs on the night of 4 July, and on 9 July, the B-29's again pounded the runways at Namsi and Taechon.²⁷⁹ But when the weather cleared enough for photography, the Reds could be seen to have made a large amount of progress. Photographs taken of Uiju on 17 July revealed frantic activity: some 5,500 feet of sod surface paralleling the runway was in use and approximately 43 MIG-15 aircraft had been flown in to

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occupy revetments. Other revetments were being built with a design that indicated that they were to shelter IL-28 bombers.²⁸⁰ Namsi and Sinuiju were again operational, while smaller airfields at Pyong-ni and Hoeryong had more than 3,000 feet of usable runway. Chungganjin was reported to be possibly serviceable.

On 20 July, with the conclusion of the military truce now actually imminent, General Weyland called on all air commands to reinstate the joint airfield neutralization program. Getting underway on the night of 20/21 July, Bomber Command "ended the war in a blaze of glory."²⁸¹ Now employing 500-pound general purpose bombs, the medium bombers attacked the runways at Uiju, Sinuiju, Namsi, Taechon, Pyong-ni, Pyongyang Main, Pyongyang East, and Saamcham. Only on 21/22 July, when 18 B-29's went after the revetted MIG's at Uiju, was the medium bomber ordnance varied: in this attack the B-29's used M-26 frags and M-20 incendiary bombs which, after careful bomb damage assessment, were credited with the destruction of 36 revetted enemy aircraft.²⁸² In the final five days of hostilities, Task Force 77 conducted three of its largest carrier raids of the war against Sondok, Wonsan, Hoeryong, Hoemun, Yonpo, Hyesanjin, and Hamhung.²⁸³ Fifth Air Force fighters and light bombers policed their list of enemy airfields, and in an additional effort this air force sent F-86 fighter-bombers to effect last minute destruction at Sinuiju and Uiju. On the afternoon of 27 July, in the period of 12 hours after the truce was signed, the 58th and 474th Fighter-Bomber Groups flew all the way to the Yalu to bomb Chunggangjin airfield, while other planes attacked Kanggye, Sunan, and Sinnak airfields.²⁸⁴ On the afternoon of 27 July photographic reconnaissance showed that all North Korean airfields were unserviceable for use by jet aircraft, but Chongjin, Chunggangjin, Hoemun, Saamcham, and Uiju had to be listed as "partially serviceable." Uiju, for example, still possessed a 6,000 x 60 foot taxiway which could possibly have received aircraft after last light on 27 July.²⁸⁵

Although the joint airfield neutralization effort was a technical success, it did not prevent the North Koreans from establishing an air order of battle on Korean soil. Later intelligence revealed that the Reds prior to 20 July had taken advantage of the inclement weather and intense ground fighting (which diverted UNC aircraft to ground sup-

port) and had flown some 200 aircraft of various types from Manchuria to Uiju airfield. Once these aircraft were in Korea, the Reds had towed most of them out of the airfield area and had dispersed and camouflaged them in the hills and cornfields along the hard-surfaced highway connecting Uiju and Sinuiju. Nearly all of these planes were damaged by collisions with obstacles on the side of the roads, but the aircraft constituted a valid air order of battle in existence in North Korea at the conclusion of the military armistice.²⁸⁶

A Note on Weapons Selection for Airfield Neutralization: During the Korean hostilities FEAF permitted its lower unit commanders a great latitude in the choice of weapons, with the result that airfields, and other targets as well, were frequently attacked with weapons ranging from 100- to 2,000-pound bombs. Bomb selection was often based upon operational factors having little to do with the degree of destruction desired on the target, and weapons were not infrequently selected by personnel not fully qualified to perform the function.²⁸⁷

Only one special study was made in FEAF concerning the most effective ordnance for neutralizing Korean airfields. This study, made by Fifth Air Force operations analysts and issued on 30 July 1951, was based on a survey of the effort required to rehabilitate Kimpo airfield (K-14), which was bombed by B-29's during a short period of time when it was occupied by the Reds. This study determined that a 500-pound general purpose bomb crater on the Kimpo runway was 35 feet in diameter and 8 to 10 feet deep, while a 100-pound general purpose crater was 25 feet in diameter and approximately 7 feet deep. Its conclusion was that five appropriately fuzed 100-pound bombs would provide a total crater area 2.5 times as large as a single 500-pound bomb.²⁸⁸ Based on World War II experience, 100-pound bombs were already the recommended ordnance for use against a typical airfield target which comprised not only runways but parked aircraft, buildings, and personnel.²⁸⁹ Bomber Command was doubtless pleased with these findings since its planes could carry more 100-pound bombs and get a better hit probability with them: although bomb loadings varied with such factors as distance to the target, a B-29's stations could load something on the order of 39 x 500-pound GP bombs, 62 x 250-pound GP bombs, or 144 x 100-pound GP bombs.²⁹⁰ As

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a matter of routine, Bomber Command employed 100-pound GP bombs as its standard ordnance for neutralizing airfields.

The fallacy in this line of thought was not apparent until the late spring of 1953, chiefly because FEAF had no agency whose specific duty was to study the physical vulnerability of North Korean targets and to make weapons recommendations. What was true at Kimpo, a fairly well-constructed airfield by USAF standards, with good drainage and numerous buildings, turned out not to be true at the Red airfields in North Korea, with the single possible exception of the built-up base at Sinuiju. Most Red airfields in North Korea had been hurriedly built with little regard for drainage: most of them were laid out on low flat land bordering rivers where the water table was extremely high. Under such circumstances, a 500- or 1,000-pound bomb would penetrate deeply enough to strike the water table, and the resultant crater would fill with water. On the other hand, the usual 100- or 250-pound bomb crater usually remained dry and was easily refilled by coolie labor. Apparently Fifth Air Force photo interpreters first noted this situation while studying Pyongyang Main airfield which, between January and early May 1953, was thrice bombed by B-29's with 100-pound bombs and was each time very easily repaired by the Communists. Given the idea, further research into the histories of typical enemy airfields showed conclusively that the Reds repaired small, dry craters with obvious facility but that in many cases only a single attack with heavier ordnance resulted in water-filled craters which in some cases were sufficient to discourage attempts at rehabilitation and in all cases gave the Communists much difficulty.²⁹¹

The relative merits of the 100-, 250-, and 500-pound general purpose bombs for use against North Korean airfields were discussed at a meeting of the FEAF Formal Target Committee on 12 May 1953, and the outcome was that Bomber Com-

mand agreed to experiment with 500-pound ordnance, which would give it fewer hits but probably longer-lasting craters.²⁹² During June, Bomber Command used the varied types of general purpose bombs against airfields, and the Fifth Air Force photo reconnaissance division came through with the opinion that the 500-pound bombs were the optimum ordnance. In the July airfield attacks, Bomber Command and the Fifth Air Force accordingly employed 500-pound general purpose bombs to crater runways. This ordnance, said the Fifth Air Force director of intelligence, caused "extensive damage" and, as predicted, the 500-pound bomb craters rapidly filled with water.²⁹³ While this evidence was persuasive, FEAF nevertheless did not believe that it was sufficient to justify any firm conclusions, and it noted simply that: "There was no apparent, significant difference between the repair time required for damage done by a bomb load of 500-pound bombs versus a bomb load of 100-pound bombs when the craters were in sod," but it observed that: "A comparison of the repair time for concrete runways seems to indicate that bomb load for bomb load, the 500-pound bomb was more effective."²⁹⁴

Although the conclusion as to what types of bombs would have been best for neutralizing North Korean airfields was indefinite, it was nonetheless evident that the long indecision regarding the matter was a clear indication of a need for valid weapons recommendations based on target vulnerability studies. On 17 July 1953 the FEAF Deputy for Intelligence established a vulnerability division with a mission to provide effective and economical weapons recommendations. Had this division been earlier established it would have undoubtedly benefited the FEAF war effort. "Good target research," stated the final FEAF report on the Korean war, "must include physical vulnerability studies and weapons selection recommendations."²⁹⁵

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Chapter V

ADJUSTMENT OF AIR MEANS TO AIR PRESSURE

The United Nations Command strategy of continuous air pressure greatly expanded the responsibilities of FEAF, whose striking power, measured as it was in terms of medium bomber, light bomber, and fighter-bomber sorties, was always quite small when compared with the tasks presented to it. Although FEAF in mid-1952 was promised some modernization of its fighter-bomber force, it could not afford to live beyond its means, and the allocation of its air effort to targets had to be equated in terms of expected losses and damages. There were many facets to this problem. Because the UNC strategy required sustained and unrelenting air pressure, air planners had to determine a rate of operations that could be supported when it was flown day after day. Each air unit had to effect a high standard of maintenance which could not only sustain a maximum daily rate of operations but which would keep a substantial proportion of its aircraft always in operational order for use against any tactical emergency which might arise. Tactics had to be implemented that would minimize losses and damages; this was necessary in order to conserve the air means and also in order to deprive the Reds of their single effective method of retaliating against the air strategy, that method being to destroy UNC aircraft. Un-

der the concept of the air pressure strategy each UNC aircraft which the Communists shot down not only reduced air capabilities but boosted the morale of the Red combat forces, who, having destroyed planes, might at least hope that they could, by some extreme effort of their own doing, rid themselves of the intolerable weight of the air pressure attacks. Training in combat skills had to be constantly emphasized in order to insure that each scarce sortie would put its ordnance on an assigned target. Organizational concepts had to be examined to determine that tasks were done efficiently by the least expenditure of scarce equipment and personnel. Better air facilities had to be provided both to speed the accomplishment of a maximum sortie effort, to increase the ordnance which each sortie could carry, and to conserve air strength against operational wear and tear and operational losses.

During the last year of the Korean hostilities, good management in all of its many aspects was thus a factor of supreme importance, and, in the final analysis, it was the factor of management which permitted FEAF to employ its limited resources in an air pressure campaign which humbled the Reds and brought about a termination of the Korean hostilities.

BOMBER COMMAND INCREASES ITS EFFECTIVENESS

The unit strength and the medium bomber aircraft allotment of the FEAF Bomber Command remained unchanged; yet by vigorously prosecuted management and training the units of Bomber Command markedly increased their combat effectiveness. Through an adherence to mission planning factors, these units met and overcame the threat posed to their obsolete con-

ventional B-29 bombers.* Although monthly sortie rates were not greatly increased, the B-29 units increased the destructivity of each shoran-directed sortie, with the result that the same number of sorties and the same sized striking forces effected an increasingly large proportion of destruction at the hostile targets which they at-

*See Chap. III, pp. 72-81.

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tacked. By good management Bomber Command magnified the combat capability of its medium bomber striking force.

The FEAF Bomber Command, although it was in theory only an operational command, worked to effect organizational homogeneity and efficiency in the three medium bombardment units entrusted to its operational control. Two of these units were assigned to the USAF Strategic Air Command: in August 1950 the 98th and 307th Bombardment Groups, Medium, had been deployed from the United States to Yokota Air Base on Honshu and to Kadena AFB on Okinawa, supposedly for a short period of temporary duty. As the war was prolonged, these groups remained at Yokota and Kadena, where after July 1952, pursuant to a SAC action that eliminated the combat group headquarters in its wings, they were reorganized as the 98th and 307th Bombardment Wings, Medium.¹ The third medium bomber unit, the 19th Bombardment Group, Medium, was a unique organization: assigned as it was to FEAF's Twentieth Air Force, it was the only medium bomber unit in the USAF which was not controlled by the SAC. When the Reds had attacked in Korea, the 19th Bombardment Wing had been based on Guam, but FEAF had directed an expedited movement of the 19th Group from Guam to Kadena: four B-29's made their first strike from Kadena on 28 June 1950 and within the next several days the whole combat group settled down there. Headquarters and other organizations of the 19th Wing remained on Guam, and to perform maintenance and support for the 19th Group at Kadena the Twentieth Air Force organized the 6332d Air Base Wing from table of distribution allotments.

The anomalous organization of the 19th Group was a matter of continuing concern to the FEAF Bomber Command: while it had the same mission directive as other medium bomber units in the theater, its commander did not control his supporting units. "Our experience," stated Brig. Gen. Wiley D. Ganey, commanding Bomber Command, on 3 October 1952, "has clearly established that the combat and direct support units of a Wing are mutually dependent; sustained effective bombardment operations cannot be conducted unless these elements are combined in a single self-sufficient organization under centralized control." Therefore, General Ganey "strongly recommended" that the 19th Group should be reorganized as the

19th Wing, under the tables of organization authorized for SAC medium bombardment wings.² Both FEAF and USAF within the next several months approved the plans to reorganize the 19th Wing, but such an action could not be immediately programmed. Effective 1 June 1953, however, the 19th Bombardment Wing and its support units were moved, less personnel and equipment, to Kadena AFB, and here the wing was simultaneously reorganized according to the organizational plan of a SAC medium bomber wing.³ The actual reorganization came too late to make much of a contribution to the Korean war, but certain preliminary steps which had been taken looking toward the reorganization benefited the combat capability of the 19th Group during the spring of 1953.

In February 1953 a rather simple organizational development had a substantial impact upon the operational effectiveness of the medium bomber units located on Okinawa. Owing to the distances involved, bomber missions flown from Okinawa to Korea were always several hours longer than those from Yokota, and in the course of these long missions Kadena-based B-29's not infrequently ran short of fuel, developed mechanical trouble, or sustained combat damages that forced them to make emergency landings either in Korea or in southern Japan. When their planes were thus forced down, the Okinawa units had to transport emergency maintenance crews and equipment to the site of the forced landing. The time lost in such a procedure necessarily reduced the in-commission rates and the combat capability of these Okinawa units. In February 1953, Bomber Command Detachment No. 1 was accordingly organized at Itazuke Air Base on Kyushu. Manned by personnel of Bomber Command, the 19th Group, and the 307th Wing, this detachment provided servicing and maintenance and messing and housing for the B-29's and their crews which were unable to return to their home base after a combat mission. This detachment accomplished its duties in a commendable manner during the remainder of the war, and it was credited with a measurable contribution to the combat capabilities of the 19th Group and the 307th Wing.⁴

In deference to the whole requirements of its global responsibilities, USAF in May 1951 had fixed the aircraft strength of the FEAF Bomber Command at 99 B-29's (30 unit equipment, plus 3

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command support planes per wing or group) counting aircraft out of commission but repairable in the theater and pipeline factors. The SAC was charged with the responsibility for providing combat attrition replacements. Actually, however, the conversion of SAC units to more modern aircraft released enough B-29's so that the FEAF Bomber Command did not have to be charged with pipeline factors: unit strength of each squadron was computed at 31 B-29's, and each squadron accepted 2 B-29's as a maintenance-acceptable coverage. In the last year of the Korean war, Bomber Command actually possessed an average of 105.6 B-29 medium bombers.⁵ The ceiling on its authorized aircraft strength, however, remained unchanged, and Bomber Command's combat capability in terms of aircraft was dependent upon its maintenance and supply support, the two factors which determined the aircraft in-commission rate of its 99 unit-strength B-29's. In June 1952 FEAF had supply support for B-29 medium bombers programmed at an anticipated sortie rate of 16 sorties per month per aircraft, but in August 1952 USAF felt itself able to announce an intention of increasing theater B-29 stock levels to support a 50 percent increase in the medium bomber sortie rate.⁶

Following the USAF decision to increase the medium bomber supply support, theater stock levels built up somewhat slowly; but, as a general rule, the materiel support for the B-29 units was very good. The 307th Wing, for example, did not have a single aircraft out of commission for parts (AOCP) for a period of 130 days commencing on 15 May 1952, and in the months of July, August, and September 1952 the Bomber Command AOCP rate was less than 1 percent. The aircraft not fully equipped (ANFE) situation was not quite so good, but FEALOGFOR developed a procedure whereby ANFE items preventing the medium bombers from flying combat missions received a priority processing akin to that employed on AOCP requisitions. A major factor which kept the AOCP rate low was the squadron flyaway kit, which the two SAC units had brought with them to the Far East and which had been subsequently provided to the 19th Group. Since these emergency supplies were designed to keep the SAC wings mobile, SAC policy officially frowned on the use of a flyaway kit items until local resources had been exhausted, but FEALOG-

FOR took a somewhat opposite viewpoint that operational requirements could not be jeopardized for the sake of maintaining the flyaway kits. As a result, the bomber squadrons, particularly those at Kadena, drew freely upon their kits to prevent AOCP's, with a consequent reduction of the levels of supply in these kits. In January 1953, however, FEALOGFOR agreed to rebuild the flyaway kits, and when supplies began to come in more freely as the result of expedited orders the FEAF Bomber Command was able to close the kits as of 6 March 1953. While there had been some apprehension that such action might result in a rising AOCP rate, such was not the case. Although the AOCP rate stood somewhat higher in the first half of 1953 than had been the case in the latter months of 1952, Bomber Command noted that FEALOGFOR's 6400th Air Depot Wing "understood the needs of the tactical units and expeditiously processed parts and equipment requests." In most instances supply items available in the theater were sent to the operating unit which requisitioned them within 24 hours after the requirement was known at the depot. Lack of some critical items of equipment did hamper the Bomber Command mission, but most of these items were in critically short supply throughout the whole USAF.⁷

During the summer of 1952 aircraft maintenance in FEAF Bomber Command units was sufficiently good to keep the command's aircraft in-commission rate above the 70 percent which was considered to be acceptable. Favorably affecting maintenance were the results of a program which, implemented in the months of March through June 1952, had rotated some 30 combat-wearied B-29's to the United States for depot reconditioning. These aircraft had been among the original planes which had come to the Far East in mid-1950; with 2,000 to 3,000 hours of airframe time, these planes had been "maintenance hogs." Prior to 1 September the remaining four B-29's in the command with airframe times in excess of 2,000 hours were rotated to the United States.⁸ On the negative side of the maintenance-capability ledger, however, was a declining level of experience among the maintenance personnel of the bomber units; within two years in the 19th Group, for example, the level of experience of aircraft maintenance technicians had fallen from an average of six years experience to less than two and one-

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half years experience. Such a decline in personnel experience levels was by no means unique in the 19th Group but was felt in the other medium bomber wings and in Fifth Air Force wings as well. The 19th Group, however, was peculiarly hard pressed because it alone of the medium bomber organizations still employed the old crew chief maintenance system whereby a single assigned crew maintained a single B-29 aircraft: thus what top-notch crews there were devoted all their talents to their own individual aircraft.⁹

Other factors besides maintenance were partly to blame, but after August 1952 the 19th Group's aircraft in-commission rate fell below Bomber Command's desired standard of 70 percent, and, in doing so, dragged the whole Bomber Command rate below this desirable figure. This fact, together with impending plans to reorganize the 19th Group to SAC standards, led to a decision that the 19th Group would have "to discard the antiquated crew chief system and start the transition to operation under SAC Manual 66-12, the specialized maintenance Bible." Beginning on 12 January 1953 the 19th Group therefore provisionally organized a periodic maintenance squadron and an armament and electronics maintenance squadron, which by the end of the month were in full operation. "Die hards," said the group commander, "were skeptical," but the new system was eminently successful. With dock maintenance in use the few available top-notch crews were no longer devoted to single aircraft but were available to all aircraft in the group: this leaven of experienced men meant much in the spring of 1953 when, of 105 airmen performing dock maintenance, only 24 had more than one year of military service. In the five months following the institution of specialized dock maintenance, the 19th Group showed a lower abort rate, a higher aircraft in-commission rate, and a higher rate of flying time per aircraft. Aborts decreased from 7 in January to 3 in May 1953; aircraft in-commission status increased from 65 percent in January to 74 percent in May; flying time per aircraft increased from 55 hours in January to 60 hours in May. Benefiting from the improved maintenance, the 28th Bombardment Squadron in March and April 1953 flew a total of 71 consecutive sorties without an air or ground abort—thus turning in a new USAF record of 50 days of 100 percent effectiveness.¹⁰

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In January 1953 the FEAF Bomber Command's aircraft in-commission rate returned to the desired 70 percent figure and it gradually inclined upward to reach 75.7 percent in July 1953.¹¹ General inspections of the three medium bomber organizations, made during the spring, reported that aircraft maintenance varied "from satisfactory to very good."¹² Only one organizational detail continued to concern Bomber Command: field maintenance, which includes such functions as engine buildup and reclamation of aircraft, was well recognized to be an essential element of the centralized maintenance system in a SAC wing, but at Yokota and Kadena field maintenance shops and engine buildup services were provided by base maintenance support organizations of the Japan Air Defense Force and the Twentieth Air Force. Reorganization plans designed to correct this deficiency were drawn up, but because of manning restrictions the FEAF Bomber Command wings continued to depend upon base maintenance support organizations for their field maintenance until after July 1953.¹³

The supply and maintenance support situation in the FEAF Bomber Command permitted each of its three medium bomber units to fly an average of 1,800 hours per month in the last year of the Korean war. Figuring the average length of a combat sortie at something more than nine hours, Bomber Command thus had a sustained operational capability of approximately 20 sorties per day.¹⁴ While all of this capability could have been utilized in all-out combat, Bomber Command perceived such a need for crew training that it required its wings individually to use some 500 hours of their monthly capability for training and evaluation purposes. Such training effort was not entirely wasted to the war effort, however, because evaluation and proficiency flights were frequently flown during dark of the moon phases against targets at which earlier combat raids had not done as much destruction as was desired. In the last year of the Korean war each wing actually averaged 1,307 combat hours per month, and Bomber Command aircraft accordingly flew an average of approximately 16 combat sorties per day.¹⁵ By a reduction in training hours, Bomber Command could, of course, increase its number of daily combat sorties. As a part of the October 1952 intensified air attack program, General Weyland asked Bomber Command to increase its daily sortie rate

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to 18 sorties, and in the period of 9 through 19 October Bomber Command launched 20-odd sorties each night.¹⁶ Such a level of combat activity was exceptional, and Bomber Command preferred not to sacrifice the theater training which its crews required to attain and maintain a high degree of operational proficiency.

From the outset of such bombing in Korea, the shoran bombing system was accurate enough to permit a large enough force of medium bombers to destroy practically any target presenting itself for attack, but such tactics were obviously uneconomical and, in view of the relatively small number of B-29's in the theater, were manifestly impracticable. Instead of saturating targets with large numbers of aircraft, Bomber Command continuously attempted with the fewest number of aircraft to effect a desired degree of destruction to its assigned targets. With the growth of Communist night air defenses in the winter of 1952-1953, moreover, the fewer planes concentrated in any one area the less likelihood there was of combat losses. As a planning objective, Bomber Command announced in August 1952 that, unless otherwise directed, it desired to obtain at least 60 percent destruction of area targets.¹⁷ Attaining such a degree of destruction would have been relatively easy had Bomber Command sent most of its available medium bomber sorties against a single target each night, but General Weyland preferred that the medium bombers should when possible attack at least two targets each night. This rule increased the psychological impact of the medium bomber attacks, but it reduced the size of individual medium bomber strike forces, often with the results that targets were under-bombed. Thus in December 1952, Bomber Command aircraft attacked 50 targets (exclusive of MPQ targets), and the average degree of destruction effected at each of these targets was only 35.5 percent.¹⁸ Such a low percentage of target destruction was unacceptable to Bomber Command, and it had already instituted a series of interrelated remedial actions, which, continuing into the spring of 1953, would bring about a significant improvement in the amount of destruction which the medium bombers would do at the targets which they attacked.

In mid-summer of 1952 the FEAF Bomber Command initiated a program of mission analysis as a joint responsibility of its targets intelligence and combat operations directorates. The purpose

of the program was to enable the command intelligently to evaluate the effectiveness of each individual strike made by its bomber units. In the process of the mission analysis, each phase leading up to and including the actual execution of the attack was critically examined. In general, the target intelligence people accomplished bomb damage assessment, while the combat operations people reviewed all available information concerning the strike, such as the plan of the mission, the conduct of the mission as varying from the plan, the status of shoran reception, and the effects of winds and weather. Following an accumulation of mission data, representatives of the two directorates met and, in effect, reconstructed the bomb run flown by the attacking unit. Conclusions drawn from the bomb damage assessment and the operations analysis were written up and presented to the commander of Bomber Command; when he had approved them, the mission analysis and the BDA report were reproduced for distribution to the bomber units and other interested agencies. The information contained in these reports served as a valid basis for much of the corrective action which was responsible for the high degree of B-29 shoran bombing effectiveness during the final seven months of the Korean conflict.¹⁹

Quite early in the course of its work, Bomber Command's mission analysis program revealed a pressing need for improvements in the shoran bombing system. One field for improvement, which has already been noted,* lay in more exact targeting for shoran attacks, and through the expansion of multiplexing capabilities, gross bombing errors attributable to inexact target locations decreased materially in November 1952. By early February 1953 General Fisher commented that: "we are almost eliminating target location errors." In this same period that the multiplexing capability was being increased, Bomber Command secured a means for more rapidly obtaining shoran computations. During most of 1952, Bomber Command obtained its shoran targeting computations through the Fifth Air Force and from the computations section of the 1st Shoran Beacon Squadron in Korea. The length of time required to process requests for computations and the resultant computations through so many channels was four or five days, and transmission garbles

*See Chap. IV, p. 96.

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and security compromises were likely. As a result of a FEAF study of this matter, Detachment 10, 1st Shoran Beacon Squadron, manned by shoran bombing computers, was established at Yokota Air Base in October 1952. Working under the operational control of the 548th Reconnaissance Technical Squadron, this detachment was able to provide all the shoran computations which Bomber Command desired, on short order if necessary, and routinely without the delays and difficulties earlier incurred when requests and computations were routed to and from Korea.²⁰

A major problem area in the FEAF Bomber Command shoran operations and a problem never solved to the complete satisfaction of the medium bomber commander involved the command assignment of the 1st Shoran Beacon Squadron: although the medium bombers were long the exclusive users and always the principal customers of the shoran bombing system, the 1st Shoran Beacon Squadron and its ground stations were assigned to the Fifth Air Force and to its 502d Tactical Control Group. Headquarters and the computations section of the 1st Shoran Beacon Squadron moved from Seoul to Pyongtaek Airfield (K-6) in the autumn of 1952, and from this location the squadron controlled five shoran station detachments: "Able" on Tokchok-to, "Baker" on Kuksa-bong, "Charlie" on Paengnyong-do, "Dog" on Hwangbyong-san, and "Easy" at Kaya-san. The "Able" and "Charlie" stations were safely located on islands off the western coast of Korea, but "Baker" and "Dog" were on mountains so close behind the battle line that there was likelihood that they would have had to be moved had the enemy made a determined ground offensive. To serve as an extra facility, "Easy" was therefore installed at Kaya-san, a mountain some 90 miles south of Seoul, and became standby operational on 25 June 1952. During October, however, "Easy" was put into some tactical use and was paired with either "Dog" or "Charlie," depending on the location of the target.²¹ In February 1952, shoran station "Easy" was moved to Songgum-ni, and the move was considered to be the first step in a Fifth Air Force plan to simplify logistical support of outlying detachments by consolidating shoran and radar sites. In its new location "Easy" backed-up the "Baker" station; and, when such was wanted, it gave the medium bombers a better coverage of the Haeju peninsula area and of targets closer

to the bomb line. But shortly after "Easy" was moved, General Weyland notified the Fifth Air Force that he was greatly concerned about any further movements which might disrupt B-29 shoran attacks; he enjoined the Fifth Air Force to take especial care before changing the location of any other stations. There were no more movements of the shoran stations while hostilities continued.²² In the conduct of its shoran operations, Bomber Command aircraft made primary use of the station-pair beams of "Baker" and "Charlie," but they relied on "Able" and "Dog" for a coverage of secondary targets.²³

When the shoran equipment in its bombers malfunctioned, Bomber Command was able to correct these defects, but when the shoran ground stations worked unsatisfactorily, Bomber Command was unable to undertake direct remedial action in units which were assigned to a laterally coequal command. Successful execution of a shoran bombing mission depended upon a proper functioning of the shoran ground stations, but there was no very safe or sure means whereby an air commander could communicate with a shoran ground site. Because of the directional characteristics of a shoran ground station's antenna, aircraft received their best shoran reception when an antenna was aligned to bear on their target. If aircraft were simultaneously scheduled to attack targets in two widely separated areas, there was a fair possibility that one aircraft would not receive both stations. This problem was met by staggering target attack times. In the last half of 1952, however, an air commander frequently reconnoitered searchlight-defended primary targets, and when these targets were not cloud shrouded he diverted the bomber stream to a secondary target. In such a diversion the air commander had to convey the information to the shoran ground stations in order that they would reorient their antennae to bear on the secondary target. Under these circumstances, an omni-directional antenna for shoran ground stations would have been invaluable; antenna reflectors were removed for a short time to see if the shoran signal strength would be strong enough to carry to both primary and secondary targets, but such was not the case and the reflectors were replaced. In August 1952 the air commander was directed to call changes of targets in to the 502d Tactical Control Group via high frequency radio, but this procedure did not prove

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satisfactory because of communications delays. Air commanders were therefore permitted to call shoran stations directly over the high frequency channel and to request necessary reorientation of antennas; this privilege, however, was as sparingly used as possible since it involved the hazard of breaking radio silence over enemy territory.²⁴

During January 1953 unsatisfactory reception of the shoran ground signals was a major problem to the medium bombers, and these reception difficulties reached a grave level on the night of 1 February when nine crews of the 98th Wing reported multiple pulsing on the "Baker-Charlie" station pair and when nine other crews from the same wing, flying later that night, got no reception at all from "Baker" station. After a careful check, the 98th Wing concluded that all of its airborne shoran equipment had been working normally, but the shoran ground stations also reported that they had no evidence that their ground equipment had been out of order.²⁵ There was some thought that the enemy might be attempting to jam the shoran beacons,^{*} but there was no evidence then, or at any other time during the Korean war, that the Communists attempted to interfere with shoran reception. The 1 February episode nevertheless indicated that the air commanders needed some means of determining whether a shoran station was operating: in the event that the first three crews in a bomber stream could not receive a shoran station, Bomber Command directed that the formation leader would institute a query to the appropriate TADC, which would relay the question to the shoran station.²⁶

Whatever their cause may have been, the shoran reception difficulties bespoke an inadequate coordination between the shoran bombers and the shoran ground station operators, and, to seek solutions, Bomber Command sponsored a bilateral conference held at Yokota on 7 March 1953. As soon as this conference was over, a team of shoran experts, drawn both from FEALOGFOR and the FEAF Bomber Command, visited each of the shoran stations in Korea. Here the bomber representatives suggested several improvements: a compass rose was manufactured and installed at the base of each ground antenna in order to facili-

^{*}A test made by the 98th Bombardment Wing in January 1953, using World War II equipment of a type which had been sold on the surplus market after the war, revealed that shoran could have been jammed.

tate the accurate alignment of antennas with bombing targets. Bomber Command, moreover, added the bearing of the target from each shoran ground site to its daily operations order. The bomber representatives also attempted to raise the morale of the shoran operators by pointing out to them the value of their equipment and by stressing the part that they were playing in the war.²⁷ A Radio Corporation of America technical representative and the FEALOGFOR technicians gave each shoran ground station a thorough going over, and FEALOGFOR undertook to provide the sites with better supply support. Following this field trip, medium bomber reception of shoran signals markedly and almost immediately improved.²⁸ In July 1953 new joint procedures were instituted for the intercommunication of the medium bombers and the shoran ground stations: as the bomber stream entered a TADC area of responsibility, the TADC was charged to notify the air commander via VHF radio of the status of shoran ground stations. When the air commander determined that a shoran ground station was not operating satisfactorily he was charged to notify the TADC, which relayed the information to the shoran station. When necessary to expedite air-ground coordination, the air commander was permitted to call the shoran station directly via high frequency radio.²⁹ As a result of close monitoring of the shoran ground stations, better supply support for them, improved air-ground communications, and accurate beaming of shoran transmissions, medium bomber shoran reception over North Korea reached an all-time peak effectiveness of 95.4 percent in July 1953.³⁰ Effective coordination thus transcended the command barriers between the shoran ground stations and the shoran bombers, but General Fisher remained firm in his belief that the primary using command should have controlled the shoran ground stations. "If SAC has any plans to do shoran bombing anywhere else," he wrote, "it is most desirable that the shoran squadrons which operate the ground stations and do the target computations be under SAC command and control."³¹

Although mission analysis and improvements in the shoran bombing system contributed, achievement of the Bomber Command goal of increased effectiveness depended directly upon the proficiency, morale, and determination of the people who made up its combat crews, for these

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were the men who put bombs on the target. In the beginning in Korea, the medium bombers had been flown by USAF career officers of the highest type, but as the war had continued it had been necessary to rotate the original crews back to the United States. The Strategic Air Command had assumed responsibility for providing replacement crews and key personnel for all Bomber Command units, and six months' combat tours had been prescribed for service in the Far East. The responsibility for providing replacements bore heavily upon the SAC, which was not a large organization and which had both to maintain the striking power of its existing combat wings and to manage the manning of a number of newly activated wings. SAC could not denude its combat ready wings to supply replacement crews for the Far East because this would have weakened the force which was the major deterrent to world-wide Communist aggression. In this situation, there had been no solution but to call upon USAF reservists or "recallee" personnel. Thus during the first and most general rotation in March 1951 FEAF Bomber Command units had experienced a nearly complete turnover of aircrews, and the majority of the replacements had been recalled reservist personnel.³² After this initial wholesale rotation, replacement schedules had been staggered and by spring of 1953 the reception of five or six replacement crews each month satisfied Bomber Command's need for medium bomber crew rotation. As was understandable, many of the replacements received by Bomber Command units in 1951 and 1952 lacked operational proficiency when they arrived in the theater; moreover, as the 19th Group observed in April 1952, "a certain amount of dissatisfaction exists in the average officer on combat status partially based on his 'recall' status and also influenced by lack of motivation."³³

The FEAF Bomber Command strongly emphasized training, but the periodicity of replacement cycles had an effect upon the bombing accuracy of the command, as was well illustrated by fluctuations in the command's circular probable error (CEP)* scored with shoran bombing techniques. During the summer of 1951, when Bomber Command had first begun to use the shoran technique

*Circular probable error is the probable bombing error expressed in terms of the radius of a circle centered on the desired mean point of impact of a bomb fall and containing half of the expected bomb fall, excluding gross errors.

as an adjunct to daytime visual bombing, the shoran CEP of the command as a whole had averaged approximately 485 feet, but during the period 1 October through 18 November 1951, when the medium bombers were beginning to use shoran as the primary bombing technique, the shoran CEP reached 1,220 feet in attacks against Namsi, Taechon, and Saamcham airfields and was assessed at 640 feet against other targets. The principal cause of the regression in bombing accuracy was attributed to a large periodic rotation of combat-skilled crews, compounded by some degree of mapping errors and the hazards of enemy air defenses protecting the three airfields. All-out emphasis on shoran training led to greater accuracy: from February through April 1952, Bomber Command claimed an average CEP for scored bombs of 639 feet, and for the period of April through July 1952 it quoted a command shoran CEP of 450 feet. Skilled crews demonstrated 350-foot CEP's, and Brig. Gen. Wiley P. Ganey in May 1952 was expecting to realize an average shoran CEP of 300 feet. "I feel," he stated, "we have already obtained bombing accuracy with our night shoran tactics that approximate our previous visual daylight formation standard, and with increased experience and development of the shoran method we will produce results in Korea that will surpass those obtained during daylight operations."³⁴

The 450-foot shoran bombing CEP, said an ARDC task group after an investigation of night-bombing systems in the Far East, was "as good a CEP as could be expected" under circumstances prevailing in Korea, but this group noted that this circular error quotation did not include gross errors. Including gross errors, the CEP's scored by the 19th Group in the months of April, May, June, and July 1952 had been respectively 508, 599, 510, and 800 feet.³⁵ The 450-foot CEP, moreover, had been recorded during a period in which relatively large numbers of B-29's had attacked single shoran aiming points along the same shoran arcs, and, as is the case in scoring circular probability errors, it counted only the best 50 percent of the bomb falls. In October 1952 and thereafter, when small numbers of B-29's attacked small targets or else attacked larger targets in larger numbers but used separate shoran arcs and aiming points, the FEAF Bomber Command mission analysis people got a closer look at individual crew performances. This more exacting analysis

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revealed that about one-half of the B-29 crews were doing most of the accurate bombing in the command.³⁶ To increase the rate of destruction of assigned targets, General Fisher promptly instituted remedial training designed to improve the shoran bombing proficiency of those crews already flying in units that revealed insufficient shoran bombing skill. General Fisher, moreover, did not quote CEP's as indications of bombing proficiency (except in the case of individual crews) but instead emphasized the percentage of destruction effected at Bomber Command targets.

By the autumn of 1952, Bomber Command began to be aided in its struggle to achieve maximum target destruction with minimum commitments of medium bomber sorties by developments which had been taking place in the United States. When Bomber Command had first begun to use shoran bombing techniques, the USAF had had no shoran training program, and such shoran bombing training as medium bomber crews received had been given to them in the Far East. Based upon combat verifications of the estimate that a shoran bombardier and his crew required at least 35 releases in which to establish proficiency, Bomber Command had sacrificed its combat potential to provide shoran practice drops. Eventually, Bomber Command had been able to give its shoran operators some 20 practice drops, but this was a maximum sacrifice of combat effort and the crews had had to get the other 15 releases which they needed to establish proficiency while on combat missions over North Korea. In the last half of 1952, however, training establishments in the United States began to catch up with the added burden imposed by the Korean hostilities: as a result of more ordered training procedures, B-29 crews who arrived in the Far East displayed higher morale and some shoran bombing proficiency. In mid-1952 USAF stated new policies as to the quality of personnel that would be allowed to enter the B-29 combat crew training program conducted by the Crew Training Air Force at Randolph AFB. Airplane commanders were furnished by a quota levied by USAF against all major commands. The majority of the pilots were no longer reservists, but were recent graduates of multiengine pilot schools. Observers were either recent school graduates or were reservists, but after May 1952 only voluntary reservists were eligible for the B-29 crew training program. Enlisted crew members were either

volunteers or recent school graduates. Upon completion of the crew training, the graduates from Randolph were assigned to the Strategic Air Command, which gave replacement training and committed the best of these crews to FEAF. Prior to mid-1952 this replacement training had been given in a number of SAC wings, but in June the replacement training function was concentrated at Forbes AFB, Topeka, Kansas, where, under the direction of SAC's 21st Air Division, the 90th Strategic Reconnaissance Wing began to prepare to give shoran training to FEAF replacements. On 1 August 1952, the 90th Wing assumed responsibility for the operational training of all FEAF B-29 replacement crews.³⁷ These developments at Randolph and Forbes had favorable results in the FEAF Bomber Command: the 13th and 14th increments of replacements which departed Forbes at the end of July and August 1952 displayed good morale and, having had up to 20 shoran practice drops, they arrived in the theater "with a shoran bombing capability equal to that of previous crews after three weeks training with their Bomber Command units." One other development had a substantial impact upon Bomber Command aircrews: as was the case in other USAF commands, reserve officers assigned to Bomber Command units were given an opportunity to decline or accept a permanent reserve commission, and those who declined (a number which included some 10 aircraft commanders, 9 pilots, and 45 observers) were relieved from duty in February and March 1953.³⁸ After 1 April 1953, FEAF Bomber Command crews were all either career officers or volunteer reserve officers. "Their attitude, interest and incentive seem much better," said General Fisher. "They are more anxious to do a job and are not so much in a big hurry to get back home."³⁹

Arrival of the shoran-trained replacement crews beginning in August 1952 lightened Bomber Command's training load but did not eliminate the need for further crew training in the theater. Bomber Command, for example, would have liked for its replacement crews to have received 30 shoran practice drops at Forbes, but equipment was limited and 20 shoran releases was the maximum training that would be possible at Forbes. Replacement crews, moreover, did not move directly from Forbes to the Far East: survival training, authorized leave, and transit times were suf-

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ficiently long as to dull the bombing proficiency of most of the newly arriving crews. As a result, some three to four weeks of theater training was needed before a replacement crew could establish its combat proficiency: this period also included standardization board rides, a few missions with older crews, and intensive shoran training.⁴⁰ Theater shoran training, moreover, was required to maintain the combat proficiency of already-assigned aircrews, many of whom were found to be in the autumn of 1952 less proficient in shoran bombing than were the newly arriving Forbes-trained replacements.⁴¹ Because of these requirements, the FEAF Bomber Command did not reduce the approximately 500 hours of flying time which it allocated to each wing or group for training purposes. In the spring of 1953, when the command's shoran-bombing proficiency was quite high, Bomber Command began to give some increased emphasis to other attack techniques which would be required for possible operations outside of Korea. Top priority was still accorded to the development and maintenance of the shoran bombing capability and to the maintenance of pilot proficiency, but attention was directed to the development of a reasonable radar bombing (APQ-13) capability and some emphasis was given to visual bombing. In April 1953, for example, the 98th Wing allotted 50 percent of its training time to shoran bombing, 20 percent to pilot proficiency, 20 percent to radar bombing, and 10 percent to visual bombing. Except for general supervision, General Fisher preferred to leave the details of training to his wing commanders. When a general inspection report noted in May 1953 that the 98th Wing and 19th Group sent combat crews on single-ship combat bombing missions for evaluation and training purposes whereas the 307th Wing made combat checks on actual command missions in the bomber stream, Fisher disagreed with the recommendation that a single command policy on the matter should be stated: he explained that each method had its advocates and that such individuality maintained a healthy competitive spirit in the bomber units, which he desired to encourage.⁴²

Other Bomber Command personnel actions rewarded meritorious aircrews and penalized those who lagged in the performance of their duties. On 15 December 1952, General Fisher defined a combat tour governing the rotation of combat

crews as being from five to seven months, in which time a crew would normally be expected to fly from 25 to 30 combat missions. Depending upon the wing or group commander's judgment as to its performance of duty, individual crews that had performed their missions exceptionally well were considered for early release after five months, but the least effective crews could be retained to a maximum of seven months.⁴³ Bomber Command actually continued to compute its crew replacement requirements on the basis of a six months' tour, but the new statement of policy promised to reward meritorious service. Under this and earlier statements of policy, Bomber Command did not care to state an exact number of combat missions which would qualify a crew for rotation. Although its policy did not automatically reward a crew for some arbitrary number of effective missions, Bomber Command insured mission effectiveness with a standing operating procedure that carefully emphasized the fact that once a mission was scheduled and launched it would proceed to its completion, regardless of the enemy opposition, provided the airplane and its equipment were operating properly. In April 1953 when an aircraft commander of the 19th Group aborted a mission in the Sinuiju area without sufficient cause (his plane was illuminated by searchlights and the flak ahead of him was very heavy), General Fisher first relieved this officer as an aircraft commander and subsequently directed his court-martial for misbehavior before the enemy.⁴⁴ Unit rivalry and esprit, properly channeled by personally interested and aggressive unit commanders, contributed immeasurably to the degree of effectiveness with which individual aircrews performed their assigned tasks.

In the autumn of 1952 the FEAF Bomber Command believed that the higher quality of its replacement crews and its own theater training program would reduce the combat CEP's of its bomber units. Although Bomber Command stopped quoting CEP's as evidences of command bombing proficiency, there were evidences of an improved bombing capability: in April 1953 the 93d Bomb Squadron of the 19th Group claimed a CEP of 340 feet for the month, a figure which was helped by three "Shacks" or zero circular errors scored by extremely proficient crews.⁴⁵ Other factors besides accuracy improved bombing effectiveness: the number of gross errors dwin-

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dled, and the abort rate on combat missions (a factor indicative of both maintenance and crew morale), which stood at a Korean high of 6.7 percent in September 1952 tapered downward so sharply that it averaged out at only 2.5 percent for the last year of hostilities, the lowest annual rate during the three years of the Korean war.⁴⁶ Beginning in January 1953, the medium bombers displayed their increased effectiveness by scoring an increasing percentage of destruction upon the targets which they attacked. Targets in this period were quite similar: most of them were accumulations of hostile supplies. There was no change in ordnance nor increase in size of the individual striking forces. But with all factors relatively constant, Bomber Command increased the average percentage of target destruction to 46.5 percent in January, to 51.3 percent in February, to 51.1 percent in March, to 63.8 percent in April, and to 69.3 percent in May 1953. Whereas in December 1952 forces of seven to nine B-29's

had attacked 50 targets and had inflicted an average of 35.5 percent destruction at each target, in May 1953 similar-sized forces attacked 44 targets of similar nature and effected an average of 69.3 percent destruction to each of them.⁴⁷ Although Bomber Command turned its attention to enemy airfields during June and July 1953, thus preventing further destructivity comparisons, its bombing accuracy remained high during the last two months of the Korean war.

In the last year of the Korean war the FEAF Bomber Command virtually doubled the combat effectiveness of its medium bomber force. This substantial improvement was attributed to several factors: mission analysis study, intensive training and competition between the bomber units, better target location by multiplex, better reception of the shoran ground stations, the improved attitude of volunteer air crews, and the personal interest and aggressiveness of each unit commander.⁴⁸

AUGMENTATION OF FIFTH AIR FORCE RESOURCES

Adaptation of Tactical Air Capabilities: The maximum combat capability which FEAF units could sustain in Korea was, as has been seen,* a derivative of the number of their possessed aircraft in terms of an operational planning factor representing logistical support and aircrew availability. According to FEAF operational planning factors, the Fifth Air Force in May 1952 had a capability to sustain a daily average of 115 F-86 sorties, 186 fighter-bomber sorties, and 63 light bomber sorties. During the heat of combat in May 1952, however, the Fifth Air Force far exceeded these programmed capability figures and actually flew some 173 F-86 and 243 fighter-bomber sorties daily. What happened when the rate of sorties flown exceeded programmed planning factors soon became apparent in the Sabre interceptor force: the Fifth Air Force had indicated that it anticipated a sortie rate of 22.2 per aircraft per month; FEAF had based its programmed support on a sortie rate of 25 per aircraft per month; the Fifth Air Force had actually flown at a sortie rate of 38.51 per aircraft per month. This wide variance between expected and actual operations immediately resulted in a short-

age of replacement engines and threatened a shortage of replacement crews.⁴⁹

After this experience in May 1952 the Fifth Air Force, as it was required to do by the strategy of continuous air pressure, resolved to pitch its operations at a sortie rate which, in context with supply and maintenance factors, would permit its units to maintain a minimum level of 75 percent of their assigned aircraft in a combat ready status. This program, which was formally implemented in September 1952, had many aspects. It required units to fly a fairly constant rate of combat and training sorties so as to insure that the logistical and personnel pipelines were always prepared to sustain the combat effort. Whenever combat sorties fell below the programmed effort, the difference would be made up by increased training sorties. In this way, tactical aircraft and crews would fly a predetermined number of hours per month and all support and maintenance actions would be geared to these standards.⁵⁰ The manner in which the Fifth Air Force closely adhered to its planning factors in the last year of the Korean war is shown in figure 15.

Although the Fifth Air Force was promised continued augmentations of F-84 Thunderjets and a replacement of its obsolete F-51 and F-80

*See Chap. I, pp. 22-23.

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FIFTH AIR FORCE ADHERENCE TO PLANNING FACTORS

1 July 1952—30 June 1953

Type aircraft	Sortie rate per month		Sortie duration		Actual combat hours per aircraft per month	Actual non-combat hours per aircraft per month
	Actual	Prog	Actual	Prog		
B-26	14.18	15.40	3.44	3.60	48.79	20.15
F-84	16.90	16.65	1.68	2.10	28.40	13.71
F-86 (FB) ¹	30.37	24.57	1.15	1.50	34.92	10.29
F-86 (FI)	21.18	29.60	1.46	1.40	30.92	7.20
F-94 ²	19.40	20.00	1.71	1.75	33.18	12.41
LT-6	22.76	16.40	2.39	2.60	54.40	9.55
RB-26	13.38	19.23	2.83	3.00	37.87	9.77
RF-80 ³	23.74	21.70	1.37	1.33	32.52	4.74
RF-86 ³	7.78	21.58	1.32	1.40	10.27	4.90

¹ F-86 fighter-bomber figures are for the period 1 May 1953 through 30 June 1953. Programmed sortie rate and sortie duration were based on F-80 planning factors.

² F-94 and RF-80 figures are for the period 1 January 1953 through 30 June 1953.

³ Only five RF-86 aircraft were authorized and an average of three of these aircraft were possessed during the period.

SOURCE: Fifth Air Force Programs Book, 9 August 1953, p. 23.

Figure 15.

fighter-bombers with new F-86F fighter-bombers, General Barcus in July 1952 was confronted with the fact that, for several months, the Fifth Air Force had been losing more aircraft to enemy action than the USAF could replace. Even more serious than the loss rate was the high damage rate which the fighter-bombers had been sustaining in combat, a rate which posed an extreme problem to maintenance. An operations analysis study revealed that in the period 1 January through 30 April 1952 a total of 828 Fifth Air Force planes had been destroyed or damaged by hostile ground fire, a figure representing a loss and damage rate of 21.6 aircraft per 1,000 sorties. This study also showed that 50 percent of assessable ground-fire hits on aircraft was received at or below 2,500 feet of altitude.⁵¹

After May 1952 the sudden change in UNC air targets from the enemy rail lines to the more diversified target system of the air pressure strategy greatly complicated Communist defenses and reduced Fifth Air Force loss and damage rates. The Communists nevertheless displayed a good ability to shift their flak defenses, and on 10 July

during the attacks against Pyongyang the Fifth Air Force lost 1 aircraft and sustained major damage to 8 and minor damages to 14 aircraft. Shortly after this incident, General Barcus fixed a minimum recovery altitude for fighter-bombers at 3,000 feet.⁵² On 10 August, after the 3d Bombardment Wing lost three aircraft in rapid succession north of the bomb line, General Barcus took the wing off operations for a period of intensive training and subsequently prescribed a light bomber attack altitude of 4,000 feet: only select crews were permitted to attack at lower levels.⁵³ Other regulations prescribed minimum operating altitudes for tactical reconnaissance aircraft.* As a general rule, aircraft were limited to one pass for each type ordnance carried, and strafing passes were curtailed, except at very lucrative targets. Fighter escort for both the fighter-bombers and reconnaissance aircraft was substantially increased.⁵⁴ These minimum altitudes could be raised or lowered in context with known flak emplacements, and they were waived at times of tactical emergency: between 12 and 26 June 1953, when the Communists were waging a major ground attack, General Anderson waived the 3,000-foot minimum recovery altitude for fighter-bombers.⁵⁵ Disturbed by the same growing order of enemy flak which had bothered General Barcus, Task Force 77 followed the Fifth Air Force lead and in August 1952 ordered its carrier air units to use dive bombing instead of glide bombing, to pull out at a minimum altitude of 3,000 feet, and to increase their flak suppression sorties.⁵⁶

That the diversification of targets under the air pressure strategy and the 3,000-foot dive-bombing recovery altitude resulted in a substantial reduction in Fifth Air Force losses and damages was revealed in an operations analysis study which covered the period 1 September 1952 through 30 April 1953. In this period 771 aircraft were lost or damaged because of hostile ground fire for a rate of 11.1 per thousand. A 19 percent decrease in the number of hits on aircraft per sortie was attributable directly to the minimum recovery altitude restriction. A further decrease of 32 percent in the number of hits on aircraft per sortie could probably be attributed to the diversified target program which confused enemy defenses.⁵⁷ During the two weeks in June 1953 when the Fifth

*See Chap. VII, pp. 257-58.

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*See pp. 100-

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Air Force waived its 3,000-foot minimum altitude, it lost 12 of the new F-86F fighter-bombers to enemy ground fire. Nine of these planes were shot down while they were flying armed reconnaissance missions at fairly low altitudes. Owing mostly to the reduction in minimum attack altitudes the Fifth Air Force lost a total of 18 aircraft to enemy ground fire, the highest such monthly total during the last year of the war.⁵⁸ Although the general adherence to a safe minimum altitude for dive-bombing recovery reduced loss and damage rates, it forced pilots to release their bombs from higher altitudes and thus carried a virtually automatic reduction in bombing accuracy. General Bane recognized that the minimum altitudes, which he had effected for the sake of conserving his force, would be accompanied by an "appreciable price paid in bombing accuracy," but he expected that increased training and more careful mission planning would preserve bombing accuracy.⁵⁹ This expectation would not be realized.*

In the 13 months of air pressure operations between 1 July 1952 and 27 July 1953, Fifth Air Force combat aircraft flew 180,205 effective combat sorties against the Communist enemy. Except for periods of increased activity in October 1952 and again in June and July 1953, the Fifth Air Force pattern of air attack was regular and sustained, varying from day to day only in context with vagaries of the weather. Such an adherence to supportable rates of combat effort, coupled with vigorously prosecuted maintenance, enabled the Fifth Air Force successfully to maintain an average of 76 percent of its combat aircraft in commission during the period, a figure which would have been higher except for difficulties encountered with the obsolete F-51's and F-80's in the several months while they were being replaced with modern F-86F fighter-bombers. In the year ending 30 June 1953, an average of 76 percent of possessed B-26's, 79 percent of possessed F-84's, and 77 percent of F-86 fighter-bombers and fighter interceptors had been kept in a combat ready status. Benefiting from adherence to planning factors which conserved aircraft already on hand and from the acquisition of new and more modern aircraft, the Fifth Air Force ended the 13 months of sustained air pressure operations with a greater

combat capability than it had possessed at the beginning of the campaign. On 31 July 1953 Fifth Air Force units possessed 128 B-26's, 218 F-84's, 132 F-86 fighter-bombers, and 165 F-86 fighter interceptors. Computed in terms of the planning factors shown in figure 15, the daily potential combat capability of the Fifth Air Force at the end of the war was on the order of 85 B-26 sorties, 181 F-84 sorties, 171 F-86 fighter-bomber sorties and 143 F-86 fighter interceptor sorties. While such an application of all available flying hours to combat sorties was theoretically possible, the Fifth Air Force was never able to neglect training and other needed flying, with the result that the actual sustained combat capability was somewhat less than its maximum potential capability. Computed again in terms of the planning factors, the actual daily combat capability of the Fifth Air Force was 60 B-26 combat sorties, 123 F-84 combat sorties, 133 F-86 fighter-bomber combat sorties, and 116 F-86 fighter interceptor sorties. Compared with the capability figures noted for May 1952, the B-26 light bomber and the F-86 interceptor capabilities in July 1953 were relatively unchanged: the B-26's were old aircraft and the Fifth Air Force had done well to maintain the light bomber capability; the relatively unchanged F-86 interceptor capability was attributable to the fact that the Fifth Air Force chose to use support programmed for the F-86 interceptors to swell the sortie rate of the F-86 fighter-bombers. Had circumstances been different the F-86 fighter-bomber support and the F-86F fighter-bombers themselves could have been employed in all-out counter-air operations. The most marked increase in Fifth Air Force combat capability was in its fighter-bombers, which in May 1952 had had a sustained capability of 196 daily sorties and which in July 1953 had a sustained capability for 256 daily sorties.⁶⁰ The various factors which increased the combat capability of the Fifth Air Force will be discussed below: while new model aircraft helped, no small part of the increased capability came from good management and efficient use of forces in Korea.

Buildup of Tactical Aircraft: At the end of 1951 the USAF had stated that: "The Korean war has had first priority in every respect and has been equipped to our poor best at the expense of SAC, the Air Defense of the United States, and our overseas deployment program."⁶¹ There was no

*See pp. 165-66.

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doubting the truth of this statement, but FEAF had nevertheless been compelled to employ many obsolete aircraft in Korea, simply because the whole USAF had been in 1950, as General Vandenberg had expressed it, "a shoe-string Air Force." Starting from a by no means modern 40-odd group Air Force in 1950, the aircraft production effort of the United States did not hit its stride before the spring of 1953.⁶² Thus in June 1950 FEAF had called for more jet fighter-bombers, but USAF, which then possessed fewer than 2,500 jet aircraft of all types in its inventory,⁶³ was unable to deliver jets and instead sent World War II Mustangs to Korea. During the last year of the Korean war increased U. S. production permitted a buildup of the Fifth Air Force and the conversion of its units to more modern aircraft.

The changing complexion of the Fifth Air Force in terms of aircraft after May 1952 was revealed in its inventory of light bomber and fighter-bomber aircraft possessed in units, which was periodically as follows:⁶⁴

	B-26	F-51	F-80	F-84	F-86*
31 May 1952.....	102	44	83	97	0
31 December 1952....	128	51	79	206	0
31 July 1953.....	128	0	0	218	132

*F-86 totals include only fighter-bomber models.

As revealed in this chart, the Fifth Air Force was able to bring its light bomber wings up to authorized strength, to phase out obsolete F-51 and F-80 fighter-bombers, to build up its F-84 wings to their authorized strength, and to reequip two of its fighter-bomber wings with F-86F fighter-bomber aircraft.

Although augmented in numbers, the Fifth Air Force's light bomber wings remained equipped with obsolete B-26 aircraft. Before the outbreak of Korean hostilities, the USAF had possessed no aircraft suitable for night interdiction operations, and when such a requirement had been met in Korea the Fifth Air Force had been compelled to use the B-26 light bombers of the 3d Bombardment Wing for night intruder work. In June 1951 still more night intruders were required, and the 17th Bombardment Wing (then designated the 452d Wing) had been added to the night interdiction force. In the spring of 1951 a board of USAF senior officers selected a modification of the British Canberra for production as the USAF B-57: this light jet bomber was designated as the

replacement for the B-26 but the B-57 was not even expected to be ready for service before 1954. Since the B-26 was no longer produced, USAF encountered extreme difficulties in providing the Fifth Air Force with the number of these aircraft which it required, especially in configurations whose specifications were frequently changed. But, lacking any better replacement aircraft, the USAF remained committed to a B-26 program that was replete with parts shortages and modification difficulties.

Although he well recognized that the B-26 was not fitted for night interdiction, General Weyland long urged USAF to bring the two light bomber wings up to war-strength authorizations, and finally in the autumn of 1951 USAF offered to increase shipments of B-26's to Korea, provided the Fifth Air Force was willing to take a number of these planes which did not entirely meet desired specifications. Not even this emergency action would be able to build up both Fifth Air Force wings to the unit equipment strength of 24 aircraft per squadron that FEAF wanted, but in the spring of 1952 a final action allocated 24 B-26's to each squadron of the 3d Wing and 16 B-26's to each squadron of the 17th Wing. The total Fifth Air Force authorization was thus set at 120 B-26's, and 60 other B-26's were established as an authorized theater reserve. In September 1952 the two light bomber wings reached their authorized strength in aircraft.*

Once they had gotten the two Fifth Air Force light bomber wings up to their authorized strength, neither USAF nor FEAF was willing or able further to change the B-26 program, even in the late summer of 1952 when the B-26 failed in its intruder tasks and had to be used for other purposes. During the course of the B-26 program the Fifth Air Force had made many changes in its desired configuration specifications, and in August 1952, when it deemphasized night intruder tactics in favor of bomber streams, the Fifth Air Force requested that B-26 replacements should be of glass-nose bombing types. FEAF was unwilling to suggest still another modification to be performed in the ZI, but it authorized local removal of nose guns and gun-pods.⁶⁵ Again on 19 October the Fifth Air Force suggested that it be given glass-nose B-26C's as replacements so far as

*B-26 problems in the 1950-1952 time period summarized here are presented in AHS-72, pp. 84-86 and 164-78.

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possible and in first priority, but FEAF replied that USAF inventories demanded that the Fifth Air Force take B-26 replacements in a ratio of 1 hard-nose straffer to each 2 glass-nose bombardier-position aircraft.⁶⁶ In November 1952 the Fifth Air Force asked for permission to raise the unit equipment aircraft strength of the 17th Wing to 24 aircraft per squadron, but USAF disapproved the request because of a shortage of potential B-26 replacements in its dwindling inventory.⁶⁷ In short, by the autumn of 1952 the B-26 light bomber program had reached an impasse: there was very little for the Fifth Air Force to do under these circumstances but to make the most acceptable tactical usage of its available B-26 forces.⁶⁸

As promised by USAF, deliveries of F-84 Thunderjet fighter-bombers to the Fifth Air Force swelled in volume and, with the notable exception of one model, improved in performance. Designed in 1944 and first flown in April 1947, the F-84 Thunderjet was a standard straight-wing jet fighter which used a relatively low-thrust J-35 engine; it had demonstrated in Korea that it was not quite fast enough to engage a MIG-15, but it had nevertheless proved to be a good fighter-bomber.⁶⁹ The first model of the Thunderjet to see combat in Korea was the F-84E, and operational and maintenance commitments were programmed in terms of this model aircraft. The F-84G was the designated successor to the F-84E (the F-84F being a swept-wing model), but production difficulties delayed deliveries of these aircraft, with the result that the Fifth Air Force learned in February 1952 that it was going to have to take, over the next five months, some 102 F-84D (Modified) aircraft. The F-84D was an outdated development of the basic production model of the Thunderjet. "We do not want those aircraft," General Everest informed his staff on 20 February, and tests run during March at Itazuke Air Base showed good reason why the F-84D would be both operationally and logistically disadvantageous to the Fifth Air Force: the F-84D carried less internal fuel and had 100 miles less range than the F-84E; it had less speed than the F-84E with the result that the two planes could not effectively fly in the same formation; a limited interchangeability of F-84D and F-84E components would increase maintenance man-hours and warehousing requirements.⁷⁰

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Despite its objections, the Fifth Air Force had to take the programmed F-84D aircraft, and General Everest in April 1952 directed that the planes would be concentrated in the 58th Fighter-Bomber Wing (then designated as the 136th Wing), his reasoning being that this wing was slated to return to the ZI at the conclusion of hostilities, at which time the F-84D's could possibly be used for equipping the ROKAF.⁷¹ In May 1952 the wing converted to F-84D's and transferred its F-84E's to the 49th Fighter-Bomber Wing. Most of the D-model aircraft received were in relatively poor condition, and, as had been anticipated, they were accompanied by higher AOCP rates. In August, when the loss of two of the F-84D's broke the wing's record of 150 days without a casualty, the commander of the 58th Wing grounded all F-84D aircraft, and in September 1952 the last of these unfortunate planes were sent back to FEALOGFOR for final disposition.⁷²

Deliveries of new model F-84G's to the Far East, beginning in August and swelling in volume in September 1952, accelerated the phase-out of the troublesome F-84D's. Two shipments of these planes were flown across the Pacific and a third arrived by aircraft carrier.⁷³ The F-84G was not a radically new airplane, but, instead, it was essentially a conventional F-84 which had been specifically designed to be a fighter-bomber: major differences between the F-84E and the F-84G were a better engine, an automatic pilot, and in-flight refueling devices in the latter model. Although some of the new planes arrived without various items of needed equipment, they were available in sufficient numbers by September 1952 to permit the Fifth Air Force to bring its F-84 wings up to unit equipment strength for the first time in over a year. According to the conversion plan, the 49th Wing was to receive all new F-84G's, the 58th was to continue temporarily with F-84E's and G's; and the 474th Wing was to receive all excess F-84E's. Beginning in August 1952 and completing in October 1952, the 49th Wing successfully transitioned to all F-84G's, but slower than anticipated deliveries after September delayed the planned one-for-one phase-out of F-84E's from the 58th Wing, with the result that the three squadrons of this wing did not completely convert to F-84G's until December 1952. This meant, in turn, that the programmed transfer of F-84E's to the 474th Wing was delayed. Most

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of the E-models destined for this wing, moreover, required prior overhaul at FEALOGFOR, and all further scheduled shipments of F-84E's to FEAF were cancelled after November 1952. All these factors combined to keep the 474th Wing at reduced strength. In December 1952 the 49th Wing's 9th Fighter-Bomber Squadron was permanently transferred to the Japan Air Defense Force to prepare for a special mission, and this movement took 25 F-84G's out of Korea. In the spring of 1953, however, the 474th Wing (redesignated the 49th Fighter-Bomber Wing on 1 April 1953*) was able to begin a slow conversion to F-84G's: by June 1953 the 8th Squadron had been equipped with these planes but the 7th Squadron still required a few more to fill out its unit equipment. Complete reequipment of the 7th Squadron was not managed before the end of the war.⁷⁴

The changes in Thunderjet models complicated supply and maintenance, but the troubles in the three F-84 wings were by no means as grave as those in the 18th and 8th Fighter-Bomber Wings, which were still equipped with obsolescent F-51's and F-80's. According to USAF programming for Fiscal Year 1953, announced in April 1952, the two squadrons of the 18th Wing and its attached 2d South African Air Force (SAAF) Squadron and the three F-80 squadrons of the 8th Wing were scheduled to convert to F-86F fighter-bombers. When this announcement was first made, FEAF's initial reaction was that the F-86F would probably not prove too successful as a fighter-bomber, and it asked that three of these squadrons should instead be converted to F-84's. USAF did not agree.⁷⁵ Tests flown by the 4th Fighter-Interceptor Group in May 1952 served to allay the FEAF fear that the F-86 might not be a good fighter-bomber: in four dive-bombing missions, the Sabres carried one 1,000-pound bomb on wing pylons opposite a filled wing tank and dropped the ordnance satisfactorily from altitudes of 20,000 feet down to 5,000 feet. When carrying a maximum load of 2 x 1,000-pound bombs, an F-86E Sabre had a safe radius of action of only 138 miles, but when it carried one bomb and one wing tank it could extend its radius to 187 miles. Despite these range limitations, the F-86 fighter-bomber possessed advantages: since they could defend themselves, flights of four

*See pp. 170-71.

Sabres enjoyed a great freedom of action; the F-86 proved to be a desirable gun platform; and the Sabre had one decided advantage over other fighter-bombers in that it could sustain prolonged high-angle dives without exceeding its critical mach number.⁷⁶

Scheduled as first to convert to F-86F fighter-bombers was the 18th Wing, whose Mustangs were on their last legs. The Fifth Air Force planned that this conversion would begin at the new airfield being built at Osan-ni (K-55), on or about 15 November 1952; given this initial date, the squadrons were to become combat ready on or about 20 November, 20 December, and 20 January 1953.⁷⁷ Pending receipt of Sabres, the 18th Wing was expected to keep its old Mustangs going, if necessary by cannibalization. The wing did keep the F-51's flying, but shortages of radiators, spark plugs, brake assemblies, and hydraulic fluid contributed to an AOCF rate which varied from 20 percent to a high of 40 percent in December 1952.⁷⁸ Slippage in programmed deliveries of the Sabre fighter-bombers delayed initiation of the 18th Wing's conversion: on 26 December 1952, however, the 18th Wing moved from Chinhae Airfield (K-10) to the new base still under construction at Osan-ni, and on 11 January 1953 the 18th Group came in from Hoengsong Airfield (K-46). First to stand down from combat was the 12th Squadron, and shortly thereafter the 2d SAAF Squadron flew its F-51's to Japan and returned to K-55 for transition training. On 15 January the 67th Squadron flew its Mustangs to K-55 where it continued combat flights with these planes until 23 January, at which time logistical considerations indicated that this last Mustang squadron might as well stand down.⁷⁹

Converting a flying organization from one type of aircraft to another is a difficult proposition under optimum conditions, but the task facing the 18th Fighter-Bomber Wing was tremendous. It moved to an unfinished airfield in the middle of the winter, where construction of maintenance shelters had not even commenced and where, with the exception of concrete flight surfaces, the whole area was "one big mud hole." The 18th Group's pilots, moreover, were mostly air reservists, none of whom were jet qualified. Only a handful of seasoned Sabre pilots were transferred to the wing from the 4th and 51st Groups. Airmen who had been maintaining conventional Mustangs had to

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be trained for more complicated jet aircraft; both the training and the jet maintenance had to be done in the open under conditions of severe cold which sapped vitality and caused illness. In the maintenance training, however, an F-86 mobile training detachment was of great assistance: beginning on 7 January this detachment held classes eight hours a day, seven days a week. On 28 January the 18th Wing received its first three Sabres, and pilot training programs, beginning on 3 February, confronted the task of providing transition for 56 USAF and 28 SAAF crews. On 25 February the 18th Group was able to fly its first combat mission with Sabres, a four-plane flight which joined a Yalu sweep. But by the end of February only 8 percent of 78 combat crews was combat ready. Dissatisfied with the progress displayed, the commander of the 18th Wing now secured authority from the Fifth Air Force to take action, and on 4 March he reassigned 30 pilots who were not displaying the necessary aptitude for the Sabres. Receipt of ZI-trained pilots and continued transition training subsequently built up the wing's crew strength: as of 30 June, 82 percent of 127 assigned pilots were qualified for combat in Sabres.⁶⁰ Actually, the assignment of Sabre aircraft lagged more than did crew production: the 12th Squadron did not reach unit equipment strength of 25 aircraft until 31 March, and the 67th Squadron finally reached its authorized aircraft strength on 7 April 1953.⁶¹

In the 8th Fighter-Bomber Wing F-80C aircraft continued to do yeoman service up to the very end, but the old Lockheed Shooting Stars, the first of the USAF's operational jet fighters and long out of production, were combat weary and increasingly scarce: beginning in September 1952, the 8th Wing had fallen below its authorized aircraft strength.⁶² The Fifth Air Force had planned that the 8th Wing would not begin converting to Sabres until the 18th Wing achieved its unit equipment plus 10 percent, but the slippage in initial F-86F fighter-bomber deliveries put the two wings into transition at approximately the same time. Sabre training got underway at the 8th Wing's base at Suwon (K-13) when the 36th Squadron stood down on 22 February. On 14 March the 35th Squadron also quit combat and began to train with the new planes. First the 35th and 80th Squadron, and then the 80th Squadron alone, continued to perform the missions as-

signed to the 8th Wing with the old F-80's: these planes continued to fly in combat until 31 April when the last F-80 fighter-bomber strikes were flown in Korea. On 1 May, the 80th Squadron officially stood down and within two weeks it was operational with Sabres. Meanwhile, the other two squadrons of the 8th Wing had begun to fly Sabres in combat: four pilots of the group flew the first combat mission on 7 April when they joined a sweep to the Yalu. Completion of the 8th Group's conversion program was greatly delayed when aircraft earmarked for the 80th Squadron arrived in the theater equipped with ultra high frequency (UHF) radio, but on 4 June 1953 this squadron received its last authorized F-86F, bringing the 8th Wing up to its proper Sabre strength.⁶³

Because of the various delays in the conversions, the Fifth Air Force cut short a transitional period wherein the 8th and 18th Wings were supposed to fly fighter-interceptor missions.⁶⁴ Dive-bomb training was accordingly begun in the 18th Wing on 1 April, and the 8th Wing integrated dive-bomb practice into its conversion period. On 13 April pilots of the 8th Group flew their first Sabre fighter-bomber mission against an enemy troop concentration, and on 14 April the 18th Group made its first combat attack against a similar target. On 27 April the 18th Group flew the first close-support mission with the new Sabres.⁶⁵

Evaluation of the F-86 as a Fighter-Bomber: Before Sabres were regularly employed as fighter-bombers, many pilots had been pessimistic. Frequently heard were such statements as: "It's much too fast," or "It's bound to be unstable at those altitudes," or "It mashes too much on dive recovery," or "They tried it once and it didn't work." But pilots of the 8th and 18th Wings proved the pessimists wrong: not only was the F-86F successfully employed as a fighter-bomber, but it had definite advantages over any other fighter-bomber aircraft in the theater.⁶⁶ After a month's combat operations, General Weyland informed USAF that he believed that the F-86F would prove to be a good fighter-bomber. "I consider it a particularly desirable improvement in our tactical force," he said, "because of its versatility in accomplishing the three phases of the tactical air force mission: that of gaining and maintaining air superiority, interdiction, and close air support."⁶⁷ Everyone knew, however, that the Sabre could

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defend itself in the air, and the real question was whether the Sabre could deliver ordnance against ground targets. At the end of Korean hostilities, when the final combat evaluation of the Sabre fighter-bomber was written up, General Anderson stated: "It is concluded that the ability of the F-86F to destroy tactical targets is equal to that of any other USAF aircraft employed in the role of a fighter-bomber in Korea."⁸⁸

After four months of combat, the Fifth Air Force described the Sabre as the most suitable fighter-bomber used in the Korean theater: it had displayed an ability to survive superior to any other USAF fighter, it was a stable gun and bomb platform, it had no airfield or operating area problems not peculiar to other jets, its high-altitude stability with external ordnance and fuel tanks was satisfactory.⁸⁹ One of the chief advantages of the F-86F as a fighter-bomber was its high mach and speed capabilities; during dive-bombing runs, pilots did not need to divert their attention to the airspeed indicators for fear that they might exceed structural limitations. With external tanks and ordnance, the allowable speed far exceeded the speeds gained on dive-bomb runs, even when the roll-in altitude was as high as 20,000 feet. Use of speed brakes permitted very steep diving angles, which contributed to bombing accuracy and reduced vulnerability to ground fire, while, at the same time, the braking action kept speeds in ranges where target tracking was not too difficult. Dive angles ranged from 50 to 70 degrees, and, with speed brakes extended and throttles retarded, the Sabre's airspeed stabilized at approximately .87 mach, giving a constant airspeed to the release point. Carrying 1,000-pound bombs and external fuel tanks, the Sabres possessed good takeoff characteristics, and they retained excellent maneuverability in the air with these loads.⁹⁰

The tactical doctrines under which the 8th and 18th Wings employed the Sabre fighter-bombers were devised to capitalize on the characteristics of these aircraft. Aircraft taxied to the runway in scheduled flight order and took off with a 3-second interval between elements. Separation between flights depended on the nature of the target: offense in depth was frequently employed in order to increase bombing accuracy, to avoid saturation of the airspace over the target, to present less of a target to enemy ground fire, and to avoid the smoke and clutter which, in larger strikes, ob-

scured targets. This offense in depth was managed by separating flights by one to three minutes on takeoff, and this same separation was found beneficial for weather penetrations and for instrument let-downs after missions were accomplished. If the target was so well defended as to demand a minimum time of attack, the Sabre formation marshalled on the runway and maintained 3-second intervals between flights. Join-up was made on course, the procedure being that the flight leader retarded his power to 92 percent until element or flights joined position, and then the whole formation initiated a normal climb to cruising altitudes.

The flexibility and lack of restriction on the operation of the Sabre fighter-bombers gave operations officers great freedom to plan the most effective dive-bomb missions. In selecting tactics, they gave first consideration to the nature of the target and to its defenses. Heavily defended targets required a minimum time in the area: against such targets the Sabres commonly stacked up flights in echelon, and all aircraft entered their bomb runs simultaneously from altitudes above the effective range of flak. In such case, each pilot attacked a separate prebriefed aiming point. Pinpoint targets were attacked from an offense-in-depth formation, in which the separation between flights ensured each pilot an opportunity to make an individual bomb run. Before they reached the target area, the Sabres usually let down and reduced power, for, by such a procedure, they arrived over the target at desired bombing entry altitudes without alerting the enemy defenses. Dive-bombing entry altitudes were usually between 12,000 and 20,000 feet, and, with speed brakes extended and throttles retarded, dive angles ranged from 50 to 70 degrees. Typical bomb-release altitudes ranged at about 6,000 feet.

Armed reconnaissance missions were usually flown at 8,000 to 10,000 feet, and once a target was located one Sabre element initiated a dive-bomb run or high-angle strafing attack, while the second element performed necessary flak suppression. On these reconnaissance sweeps, the Sabre elements scissored for evasive action and kept approximately line abreast formation. When a potential target was sighted, they usually found it best to over-fly it and then to return a few minutes later and initiate the attack from a different direction, thus ensuring surprise. Unless handled intelligently, these armed reconnaissance missions

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posed extreme hazards: as has been seen, in the period of 12-19 June 1953 (when the 3,000-foot minimum altitude restriction was relaxed) 9 out of 12 Sabres lost were shot down on armed reconnaissance missions. Several of these losses were attributed to the fact that the flights had unwisely attempted second attacks against the same target.

Close-support scrambles usually employed four Sabres under the lead of an experienced and well-briefed pilot. Tactics used in such missions were much the same as for other fighter-bombers,* and a survey of opinion among Mosquito controllers established that most of them favored the F-86 over the F-84 for close-support work, principally because of the Sabre's steeper dive angle and more accurate bombing. The F-86, however, could not stay in the target area as long as an F-84, and it orbited at such high altitudes that it required more time for proper target identification.

In the course of a napalm or skip-bombing attack, the Sabre fighter-bombers maintained a cruising altitude to the target area, where, after identifying the target to be attacked, they proceeded to a point about 10 miles away and then let down for low-level runs. They planned their attacks so that the aiming point was always in sight, and while still two or three miles out the pilots lined up on the target fairly exactly, thus preventing major corrections in course at the last minute. At airspeeds of over 500 knots, the Sabre pilots successfully made single releases of 750-pound E-74 fire bombs and 120-gallon napalm tanks: in such cases they usually experienced a slight wing roll, but this was easily corrected. To save time on skip-bombing runs, the Sabres usually flew line abreast in flights or elements and made simultaneous drops. In all low-level attacks, the Sabres strafed as a countermeasure to small arms fire.

Aircraft characteristics and tactics which exploited them made the F-86F an outstanding fighter-bomber, but in its existing configuration the plane met some difficulties. The chief shortcoming was its limited range: carrying two 120-gallon external fuel tanks, which were retained except in emergencies, the F-86F had an ordnance-carrying radius of action of slightly more than 200 miles. Cognizant that more range would be occasionally needed, the Air Materiel Command had procured a limited number of 200-gallon ex-

ternal tanks, and, when carrying two of these tanks and two 1,000-pound bombs with conical fins, the F-86F had a radius of action of approximately 360 nautical miles. These radius calculations allowed 15 minutes for target identification, additional time for join-up after a strike and for orbiting before landing, and provided for a retained reserve of 500 pounds of fuel. By a reduction of these safety factors, the Sabre's radius of action could be stretched as much as 50 miles. Sabres equipped with solid leading edge wings had a slightly greater range than those equipped with slats, and, although this configuration caused a very low angle on takeoff when ordnance and external fuel were carried, the solid leading edge Sabres had otherwise equal capabilities on all fighter-bomber missions. Operationally, the external fuel tanks presented little difficulty. The 120-gallon tanks were stable in flight, but the 200-gallon tanks produced a controllable porpoising tendency at high altitudes. Although not ordinarily jettisoned by the fighter-bombers, external tanks could be dropped without damage from level attitudes at speeds ranging between .75 and .85 mach. When stuka-type fins were installed on them, the 200-gallon tanks had better dropping characteristics. Although technical orders cautioned care in recovery pull-outs with external tanks, the Sabres made repeated recoveries at forces exceeding 7 G's without sustaining damage.

As was true with other Fifth Air Force fighters, the Sabre fighter-bombers experienced difficulties with the existing gun-bomb-rocket sighting systems.† The F-86F wing station configuration also gave trouble. Since outboard pylons had no arming devices they could be used only for carrying fuel: modification was deemed necessary to permit the Sabres to carry munitions on all pylons against short-range targets. The stationary inboard bomb pylons were not satisfactory because they restricted the mach of the aircraft: needed were flush-mounted or droppable pylons which, by reducing drag, would increase range and air-to-air fighting capabilities. Inboard bombs, moreover, could not be manually jettisoned without dropping outboard fuel tanks, a feature which was detrimental in combat. Rocket adapters for the Sabre's pylons were not available in Korea,

*See Chap. VI, pp. 216-17.

†See Chap. III, pp. 64-66.

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and lack of suitable bracket and rod safety devices prevented the F-86F's from carrying proximity-fused bombs. In its final combat evaluation of the F-86F fighter-bomber, the Fifth Air Force recommended that all of these deficiencies should be corrected. It also recommended that an investigation be made to determine whether additional ordnance-carrying pylons could be installed on the wings of the airplanes.⁹¹

Tactical Aircrew Problems: During the first years of the Korean hostilities, the experience level of Fifth Air Force aircrews had been relatively high, but the quantity of tactical air crews had been scarce. In sharp contrast, during the last year of the Korean war the number of crews on hand in the Fifth Air Force became excessive and the experience level of the individual crew was lower than desirable. Deficient proficiency of light bomber crews adversely affected the operations of the light bombardment wings, while an influx of excessive numbers of inexperienced fighter pilots put a severe burden upon the Korean fighter wings. The Fifth Air Force posted the following periodic statement of average combat crews possessed versus crews combat ready:⁹²

	B-26	F-51	F-80	F-84	F-86*
May 1952					
Possessed.....	172	102	111	219	215
Combat ready.....	126	78	92	159	151
December 1952					
Possessed.....	183	86	127	313	266
Combat ready.....	111	72	107	213	196
July 1953					
Possessed.....	184	0	0	381	498
Combat ready.....	132	0	0	227	410

*Includes F-86 fighter-interceptor and fighter-bomber crews.

During the course of the entire Korean war, the Fifth Air Force never obtained that quality of B-26 crews which it desired and required for the proper performance of a light bomber night interdiction mission. Fundamentally, this problem derived from the fact that even in 1950 the B-26 was obsolete and the only light bomber unit in the USAF that had possessed this type aircraft was the 3d Wing. To provide replacement crews, USAF had established a B-26 combat crew training school at Langley AFB, Virginia, late in 1950, and it had drawn upon reserve ranks to secure the initial allotments of personnel for the recalled 452d Bombardment Wing (later the 17th Wing) which was dispatched to FEAF. Lacking adequate bombing and gunnery ranges and physically

incapable of much expansion, the Langley Combat Crew Training School's output of B-26 crews frequently failed to meet Korean attrition and rotational requirements. When this was the case, USAF levied on ZI commands for casual personnel, who were formed into crew elements for further training in the Far East. Although certain qualifications were established for B-26 replacement crews sent to Korea, the Fifth Air Force noted that the spirit of these regulations was often violated: "Instead of getting the highest qualified individual for this type of flying," noted a Fifth Air Force officer, "we have frequently received . . . the man who can be spared easiest."⁹³ Even in the last year of the Korean war, when ZI training programs were generally satisfactory, both FEAF and the Fifth Air Force were dissatisfied with the B-26 crews which came from Langley. For one thing, these replacement crews arrived in the theater at an average of 55 days after graduation from the training school: in such a length of time they had already forgotten part of their training and their proficiency was "poor to not acceptable."⁹⁴ Under such circumstances, each new crew received by the 3d and 17th Bombardment Wings required an average of 25 hours of flying training before it could be placed in combat, and these two wings customarily flew one out of four hours of their capability in training. About 10 hours of this total represented theater indoctrination training, but about 15 hours of it represented proficiency training which could have better been given somewhere in the United States.

In night intruder work two tactical employments of aircraft are permitted: the crews could get down on the deck and strafe targets or else they could bomb these targets from medium and low altitudes. Against targets of opportunity encountered at night, the Fifth Air Force recognized that strafing had a higher inherent kill probability than did bombing, but a series of B-26 losses in August 1952 convinced General Barcus that his intruder crews, as a whole, were incapable of low-level night strafing attacks. "We'd like to be able to strafe," said a Fifth Air Force spokesman, "but with the crews we are getting—and we think we have now about the average that we can logically be expected to receive—we don't feel that we will have the capability to strafe as a tactic that every crew could employ."⁹⁵

The other tactic possible to night intruder crews

was to bomb targets of opportunity from low and medium levels. But the status of bombardier-qualified observers in the Korean light bombardment wings had always been unsatisfactory. Qualified bombardiers were in short supply in USAF skill inventories and the SAC had naturally been given a priority for such of these officers as were available. In recognition of the fact that night intruders were "lone wolf" aircraft, each light bomber crew was authorized two observers, one with navigator qualifications and the other a bombardier, but, beginning in March 1952, USAF had been compelled to reduce the flow of replacement observers to the Korean light bomb wings from two to one per crew. As a result by August 1952 the 3d Wing had only 63 percent and the 17th Wing only 70 percent of their authorized observers. In September, when diversion of the light bomber replacement crew flow through a two weeks' survival course in the ZI threatened further to reduce observer strength, the Fifth Air Force had temporarily to raise the minimum combat mission tour for observers from the standard 50 to as many as 55 or 60 missions. Not only were these observers possessed in short supply, but the Korean wings had very little success in their efforts to qualify such of their observers as were supposed to be bombardiers: the Fifth Air Force expected its bombardiers to display a CEP of 250 feet from 6,000-foot bombing altitudes, but tests conducted in June 1952 revealed that the CEP's of new crews were approximately 500 feet. These tests also showed that the average replacement crew did not attain the required standard CEP until it had flown 38 combat missions out of a 50-mission combat tour.⁹⁸ Allied tests demonstrated that the destruction of a vehicle required hits within 50 to 75 feet of it; and such precision attacks were obviously impossible from crews who could not even meet the standard 250-foot CEP.⁹⁷

By August 1952 it was evident that the state of skill of the average light bomber crew was not sufficient either for low-level strafing or for precision bombing, and the Fifth Air Force had no choice but to direct a change in the employment of its light bomber effort. Surveys indicated that there were enough skilled crews to man two intruder squadrons, crews who could safely attack at night from low altitudes. The majority of light bomber crews, four squadrons of them, had to be diverted to more conventional light bomber

attacks: day formation raids and night bomber-streams, both of which would use bombing tactics from reasonably safe 4,000-foot altitudes. This change in tactics was reluctantly made: "We diverted . . . to a straight light bomb role, both day and night, only to fully utilize what capability we had," stated the Fifth Air Force director of operations. He added that: "We'd like to get back to 100 percent utilization of what B-26 capability we have in individual night work . . . if we had crews qualified to do it."⁹⁸

The change to conventional bombing tactics permitted some alleviation of the shortage of B-26 observers. In October 1952 the Fifth Air Force stated that observers would be allocated to the light bomber wings on a ratio of one per crew, but two observers were still authorized for lead and deputy lead crews in day formations and for the control crew in a night bomber stream. Even this change in tactics and authorizations found the Fifth Air Force still short of bombardiers: in October it therefore made arrangements to borrow some 18 qualified bombardiers from the FEAF Bomber Command for 60 to 90 days of temporary duty.⁹⁹ In November, USAF directed that all observer personnel on flying status in the grade of major or below would be assigned to appropriate crew duty regardless of grade authorizations.¹⁰⁰ And in February 1953 the Fifth Air Force permitted the light bomber wings to place flight mechanics on flying status in lieu of unfilled authorizations for aerial observers. These emergency actions, plus some output of newly trained observers from ZI schools, provided some alleviation to the pressing shortages, and by February 1953 the Fifth Air Force was able to cancel its requirements on Bomber Command for temporary duty bombardiers. There was, however, no return to a standard B-26 crew composition of one pilot, two observers, and one gunner.¹⁰¹

Not serious enough to warrant changing from optimum tactics as was the case with the light bombers but still productive of difficulties was the supply of replacement fighter pilots to the Fifth Air Force. In the first year of Korean hostilities Korean fighter pilots were generally of a high standard of proficiency as was expected of USAF career officers, but the fighter units in Korea, manned during 1950 at peacetime levels, had possessed only a limited number of these individually well-qualified crews. Effective in May 1951, more-

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over, FEAF began to rotate crews who had fought in Korea from the beginning of the conflict: in the same number as replacements were received, wing commanders were permitted to rotate fighter pilots after a normal minimum of 100 combat missions and light bomber crews after a minimum of 50 combat missions.¹⁰² To support this rotational program, USAF established and where possible expanded fighter pilot combat crew training schools. An F-51 Combat Crew Training School (CCTS) located first at Nellis AFB, Las Vegas, Nevada, and later at Luke AFB, Phoenix, Arizona, turned out 14 crews every two weeks. In June 1951 the jet fighter pilot CCTS was divided between Nellis and Luke, and in combination these two schools turned out about 45 pilots every two weeks. Virtually all personnel graduating from these schools were assigned to units in the Far East, and when these sources provided inadequate numbers of replacements USAF filled FEAF quotas by levying upon ZI commands.¹⁰³

During 1951 the average replacement fighter pilot received in Korea was either an air reservist or a regular Air Force pilot with some background experience, but in this same year USAF accelerated its training programs, and, increasingly after early 1952, the major problem concerning Far East fighter pilot replacements was one of excessive numbers and limited levels of personal experience.* Many of these recently graduated pilots needed strong direction in combat until they themselves became seasoned, but by the autumn of 1952 the flow of field-grade pilot replacements to the Fifth Air Force became deficient. Shortages of experienced pilots were first noted in the Thunderjet wings in October 1952 and they became more serious each month. The Fifth Air Force first attempted to meet the situation by assigning field-grade Sabre pilots to Thunderjet wings but, because of this action, the supply of experienced Sabre pilots, previously satisfactory, also became a problem area.¹⁰⁴ By March 1953 the experience level among fighter pilot replacements was so low that the Fifth Air Force stated a number of emergency requirements for field-grade replacements, and it further requested that it be provided one well-qualified first lieutenant or captain for each seven newly graduated second lieutenants. USAF had already directed the Air Training Command

*See Chap. III, p. 60.

to provide replacement pilots with a minimum of 40-hours flying time in the aircraft they would operate in Korea; in view of its low experience level, the Fifth Air Force asked that this minimum flying time be increased to 80 hours.¹⁰⁵ In response to these requests, USAF allocated emergency shipments of a limited number of field-grade replacements, but it reiterated that the majority of jet pilot replacements would necessarily continue to be recently graduated officers.¹⁰⁶ Fortunately, the Fifth Air Force got some temporary relief to this problem when experienced flight and element leaders volunteered for extensions of their combat tours, and an increase in field-grade replacement crews was evidenced in the personnel flow during June 1953.¹⁰⁷

During the last year of the Korean war the Fifth Air Force adhered quite closely to programmed planning factors (*see* figure 15). Such an adherence to an orderly program of operations should, at least in theory, have facilitated a similarly ordered requisitioning, reception, and utilization of combat crews. But to be sure that combat replacements would be on hand when they were needed, they had to be requisitioned several months in advance of the time when they would be needed, and in the time interval between the requisition and the reception of the combat crews, any number of variable factors, including adverse weather, could have changed Korean sortie rates. In view of these many variables, FEAF considered that a deviation of as much as 20 percent from manning standards was not unreasonable in Korea.¹⁰⁸ Through a combination of miscalculated personnel actions and adverse flying weather, Fifth Air Force Sabre and Thunderjet wings were flooded with a surplus of replacement pilots during the winter of 1952-1953.

The problem of excessive aircrews was most serious in the Sabre wings because the personnel flow into these units was affected both by bad flying weather and by unanticipated slippages in the conversion of the 8th and 18th Fighter-Bomber Wings. In requisitioning Sabre crew replacements, Fifth Air Force personnel assumed that the two F-86 interceptor wings would fly sorties as programmed during the latter part of 1952, but unfavorable flying weather compelled the 4th and 51st Wings to fly fewer sorties than had been programmed. Since the crew sortie rate was

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cut at the same time that replacements arrived in undiminished flow, both wings by December had accumulated an excessive number of aircrews. Too many crews on hand lowered unit morale and flying efficiency: in the 4th Wing the monthly sortie rate per combat ready crew declined from 22.4 sorties in October to a low of 15.5 in December, with the result that the crews had to face longer combat tours and that they actually did not get to fly the number of combat flights each month which they required to maintain efficiency.¹⁰⁹ Early in December, Fifth Air Force personnel officers took actions designed to provide replacements for the 8th and 18th Fighter-Bomber Wings: the flow of F-80 and F-51 crews was discontinued and two new flows of F-86 replacement pilots were scheduled for the 8th and 18th Wings beginning in January 1953. Through some lapse in liaison, Fifth Air Force personnel officers had assumed that the F-86 pilots earmarked for the 8th and 18th Wings would have been trained in fighter-bomber tactics. Actually, however, the Sabre fighter-bomber CCTS at Nellis AFB did not graduate its first class until 31 January, and thus all Sabre pilots who arrived in Korea during January and February were specialists in fighter-interceptor tactics.¹¹⁰

In view of the existing crew overages in the 4th and 51st Wings, the Fifth Air Force during January diverted incoming F-86 interceptor pilots into the 8th Fighter-Bomber Wing, where they could, for the time being, fly F-80's. Failing to get fighter-bomber trained Sabre pilots, the 18th Wing during January and February attempted to give transition training to a number of inept Mustang pilots who ultimately would have to be washed out.¹¹¹ At the end of February, the 8th Wing also began its transition, but neither of the two wings made as much progress in their conversion programs as had been planned, owing chiefly to delayed deliveries of aircraft. Already with excessive numbers of pilots on hand, the Sabre wings were thus increasingly overmanned by undiminished replacement flow schedules. During April 1953, for example, the Fifth Air Force received 121 F-86 pilots, 54 more than it needed during this month. Most of these replacements, moreover, were recently graduated pilots who possessed an average of 340 to 350 total hours of flying time, with 50 to 60 hours in Sabres.¹¹²

By April the four Sabre wings had so many surplus pilots that they were confronted with lowered individual flying proficiency, swamped training facilities, and actual housing shortages. The wing replacement training units were unable to accommodate all of the newcomers, with the result that many of them had to sit around and lose much of the proficiency they had when they arrived in the theater. Lack of maintained flying proficiency showed its effect in a rising number of aircraft accidents. One solution to the problem would have been to phase out pilots at mission levels short of the 100 mission combat tour, but this was impracticable because of shortages in experienced pilots. Seeking a better solution, the Fifth Air Force in April requested USAF to cut back its scheduled replacement flows for June and July; to get immediate relief it authorized the 4th and 51st Wings to reassign 35 extra pilots to the 6147th Tactical Control Group. The flow of crews could hardly be diverted on as short an order as the Fifth Air Force desired, and the May input of both F-86 and F-84 crews exceeded requirements for them. The number of crews on hand was still excessive in June, but markedly increased combat sortie rates in June and July gave employment to more pilots. Effective in July and August, moreover, USAF greatly reduced the flow of replacements, with the result that the pilot inventories began to approach more normal proportions. At the end of the war the Fifth Air Force instituted a combat crew phase out program which soon reduced its strength to authorized crew levels.¹¹³ In search of a lesson from this experience, FEAF noted that vagaries in the weather had caused much of the trouble, but it stated that the Sabre crew experience well illustrated "a need for accurate scheduling to coordinate the arrival of aircraft and personnel to man and maintain the aircraft."¹¹⁴

Under normal circumstances in any combat theater, newly arrived aircrews require theater indoctrination training before they can be counted as combat ready. Because of marked variations in the proficiencies of the crews which they received, Fifth Air Force fighter wings had not only to give this theater indoctrination training but they also were compelled to use a large proportion of their available flying hours in establishing acceptable individual flying proficiency. Except

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for the issuance of broad directives, the Fifth Air Force chose to vest responsibility for flying training in its combat wings. Each of these combat wings therefore operated provisional training flights, which invariably were commanded by a combat experienced pilot of at least flight-leader caliber. The provisional training flights were usually located at the bases in Japan where the wings conducted their rear echelon maintenance. How much training an individual pilot replacement received in these training flights depended upon his individual background: pilots with over 200 hours in the type plane they would fly in Korea, for example, got only brief training necessary to indoctrinate them in the conditions peculiar to the theater; less experienced pilots got so much of the whole flying training course as the training flight commander considered that they needed to establish them as "combat ready" pilots. One pilot might be declared combat ready after a very few training flights, while another might be put through twice as much training. The wing training programs were thus flexible, and each differed somewhat from the other, but each accomplished the same general objectives. As an illustration of a full training program, the course of instruction used by the 474th Fighter-Bomber Wing in the latter half of 1952 may be noticed: this program included detailed instruction on operational and emergency methods in F-84 Thunderjets; briefings on survival problems in North Korea, the geography of Korea, and on ground force operations and techniques; and finally flying training which included pinpoint navigation, location of camouflaged enemy targets, and mock-bombing and strafing runs on bridges and marshalling yards. At the end of a course of instruction, two instructor pilots and two trainee pilots worked together in a four-plane strike over enemy territory against a target especially selected in an area where enemy flak was light and Red jets were not to be expected. Although this training was undoubtedly necessary, it became more and more burdensome toward the end of the war when most replacements were of a generally low level of experience. In the last year of the war, as may be seen in figure 15, the Korean fighter wings used over 20 percent of their capability in noncombat flying, most of which represented training requirements.¹¹⁵

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Once the replacement pilot became "combat ready" and reported to a squadron, his training was not ended because each of the Fifth Air Force combat wings emphasized continuation training. As a matter of routine this continuation training concerned such matters as the establishment of proficiency for leading or flying close-support missions, for flying night combat missions, or for flying combat missions north of the Chongchon River.¹¹⁶ In the autumn of 1952, however, General Barcus ordered all fighter-bomber wings to implement a major dive-bombing continuation training program. The requirement for such a program was first indicated in the June 1952 fighter-bomber attacks against the North Korean hydroelectric plants, for photo interpreters at FEAF noted that the status of bombing accuracy in these missions had not been too good. On 17 July, Brig. Gen. Jacob E. Smart, FEAF deputy for operations, passed this information to General Barcus, with the suggestion that the latter would do well to put the dive-bombing ability of his fighter-bomber crews under special scrutiny.¹¹⁷ At about this same time, General Barcus raised minimum altitudes for dive-bombing pullout to 3,000 feet, and, while he recognized that this action would have some costs in reduced bombing accuracy, he hoped that increased training would preserve bombing accuracy.¹¹⁸

By a personally signed command letter written on 25 August 1952, General Barcus directed his wings to conduct special continuation dive-bomb training for all fighter-bomber pilots during the course of which every pilot would be expected to qualify as an expert under the standards specified in Air Force Manual 355-25. One flight of five aircraft in rotation from each fighter-bomber squadron would be withdrawn from combat and maintained on a training status, and this flight would fly bombing missions against the two scorable ranges at Naktong and Kunsan. Each group would designate an experienced pilot, selected for his demonstrated proficiency in dive-bombing, to teach proper bombing techniques. All pilots who failed to qualify in the expert class after nine practice missions would be returned to a group's replacement training flight for further training, and, after a reasonable number of missions in the replacement training flight, a pilot who still could

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not qualify was to be reclassified and assigned other duties commensurate with his abilities.¹¹⁹

During the period of August through October 1952 the four Fifth Air Force fighter-bomber wings implemented the continuation dive-bombing training program as ordered. All parties recognized that the conditions under which this training was undertaken were vastly different than those met north of the bomb line: only two small and easily identifiable ranges were available and flight patterns at each of them were rigidly controlled—down to a 90-degree turn off the base leg at Nak-tong. The program nevertheless made for some beneficial standardization of bombing techniques, which had previously been lacking, even within wings: each wing selected the dive angles and attack techniques which were best suited to its aircraft, and all pilots were drilled in these techniques. Although experienced pilots displayed only slight improvements in bombing accuracy, the less experienced men benefited from the additional opportunity to practice. Bombing results, moreover, were generally good: out of 3,499 bomb drops by 298 pilots, the combined circular probable error was 225 feet. Most bombs were released at altitudes between 4,500 and 5,500 feet, and the operations analysis study which reported the results of the training program doubted that any group of USAF pilots could do much better than the 225-foot CEP when they released bombs from such altitudes.¹²⁰

The bombing results scored during the continuation training program seemed reasonably accurate, but the Fifth Air Force thought that competition among the fighter-bomber squadrons might result in an eventual betterment of the 225-foot CEP. Unfortunately, however, dive-bombing accuracy in combat did not improve but instead worsened. An assessment of the combat accuracy of Fifth Air Force fighter-bombers issued in December 1952 indicated that the fighter-bomber CEP against pinpoint combat targets was 340 feet. In the spring of 1953 fighter-bomber accuracy degenerated still further: assessed results in May through July 1953 indicated that the CEP against pinpoint targets had risen to 514 feet. At the conclusion of the Korean hostilities, the Fifth Air Force operations analysis office demonstrated the general decline in fighter-bomber accuracy with the following statistics:

	Line Targets		Pinpoint Targets	
	50 percent distance in feet	Percent of hits	Radius of 50 percent circle in feet	Percent of hits
1951-----	75	8.1	-----	-----
1952-----	125	7.2	340	11.2
1953-----	219	5.8	514	3.9
Over-all-----	115	7.4	390	9.3

Since there was no great change in operating conditions between the autumn of 1952 and the spring of 1953, the operations analysts could only suggest that the marked decline in bombing accuracy during the latter period might be attributable to "the scarcity of good pinpoint targets and the general character of a static war."¹²¹

The decline of bombing accuracy in the Fifth Air Force fighter-bomber wings over the several years of the Korean war is explainable in terms of the growth of enemy opposition, both air and ground, which compelled crews to bomb from higher altitudes and to employ dive-bombing instead of glide-bombing tactics. But the marked decline in fighter-bomber crew effectiveness during the last year of the Korean war, as evidenced by the less accurate bombing, is difficult to evaluate. In this same period of time, and state of the war, the medium bomber crews increased the effectiveness of their strikes. It would appear that the objectives of the air pressure strategy were never clearly communicated within the Fifth Air Force. Many fighter-bomber pilots must have lacked adequate motivation and thus failed to give their best in what they considered to be a "static war." "This is indeed a strange war," stated one fighter-bomber group commander in August 1952, "where patience and planning are as important as courage and ability. Primarily the American airman is an aggressive as well as a skilled warrior, and the relatively casual pace of the Korean conflict is against his inbred nature."¹²² The minimum altitude restrictions, which accepted lowered bombing accuracy, were distasteful to some pilots: "If it is worth being here at all," one of them commented, "it is for the damage we can inflict on the enemy."¹²³ Another fighter-bomber squadron historical officer, writing in September 1952, made a penetrating comment which went far in explaining the difference in outlook between fighter and bomber crews: "A fighter outfit," he wrote, "is a

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peculiar organization which, to a very great extent, runs on spirit. . . . A fighter pilot can be ordered into the air but nobody is going to be with him in the cockpit to see that he makes a determined effort to put his bombs on the target, which, in the case of a fighter-bomber, is the reason for existing of the pilot and airplane."¹²⁴

Development of REMCO Activities: During the winter of 1951-1952 most Fifth Air Force combat wings, drawing upon the flexibility of the wing-base organizational plan, had established rear-echelon maintenance detachments at air bases in southern Japan. The reasons lying behind these actions were simple. Korean airfields possessed few of the shops and warehouses which were available and otherwise unused at bases in southern Japan. The amount of heavy equipment and supplies required by a tactical wing was so tremendous in volume and in weight that no wing had ever gotten completely into operation in Korea. Aircraft, supplies, and skilled technicians were limited and had to be utilized in the most efficient manner. And finally, the maintenance records of the first two wings which employed the rear-echelon detachments were so much better than those of the wings that moved entirely to Korea as to give a striking object lesson as to the value of the somewhat unorthodox procedure.*

Taking all these factors into consideration, the Fifth Air Force on 18 August 1951 had directed the establishment of rear-echelon maintenance detachments for all F-80 and F-84 aircraft at Tsuiki and Itazuke airfields. At Itazuke Thunderjet maintenance was accomplished by detachments of the 49th and 136th (58th) Fighter-Bomber Wings. Detachments of the 8th and 51st Wings performed rear-echelon maintenance on F-80 aircraft at Tsuiki until November 1951, when conversion of the latter wing to Sabre aircraft caused the 8th Wing detachment to move to Itazuke, thereby freeing Tsuiki for the establishment of 4th and 51st Wing rear-echelon F-86 maintenance. During November 1951 the 3d Bombardment and 67th Tactical Reconnaissance Wings sent detachments to Miho, where the 452d (17th) Bombardment Wing already conducted rear-echelon maintenance. In its formative period the rear-echelon maintenance system thus required two or more wings, which used like type aircraft, to operate

*See AHS-72, pp. 100-104.

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rear area maintenance detachments at the same Japanese airfields. These detachments comprised personnel and equipment withdrawn from a wing's maintenance, supply, and tactical squadrons, and each detachment thus constituted a somewhat involved problem in administration. There was no clear-cut command supervision of the rear area maintenance activities, and, since each detachment belonged to a different wing, each commander followed his natural tendency to maintain unit integrity and to retain control of all personnel and equipment: the result was much duplication of supply accounts, motor pools, equipment, and maintenance shops. It was easy to see that better control and efficiency could be secured if the maintenance functions were operated by one local commander with appropriate manning documents and equipment lists.¹²⁵

Rear-echelon maintenance combined operations (REMCO) was the developmental solution to the duplication and confusion which accompanied the operations of the initially separate wing rear-echelon detachments. On 4 April 1952 the REMCO system was initiated at Itazuke when the 49th and 136th (58th) Wings decided to try complete integration: at this time the 136th Wing assumed command of the 188 men equally assigned at Itazuke by both wings. A forward control office was established at Taegu to monitor the flow of F-84's to and from the Itazuke REMCO, and, while at Itazuke, both airmen and aircraft lost organizational identity, thus precluding any favoritism in their work.¹²⁶ In April the 3d, 452d (17th), and 67th Wings also consolidated their detachments at Miho, but this B-26 REMCO was again reorganized in June 1952 pursuant to a Fifth Air Force directive which placed it under the command of the 17th Wing. At this time the three wings undertook to furnish a total of 28 officers and 820 airmen, proportionately figured according to their respective share of the expected workload, and wing property required to perform all major and second intermediate inspections was shipped to the Miho REMCO for accountability.¹²⁷

After somewhat divergent beginnings, the Fifth Air Force REMCO concept was generally standardized to include such aircraft field maintenance, major inspections, engine buildup, and engine minor repair as was appropriate to the type of aircraft handled. The 58th Wing operated the F-84 REMCO at Itazuke, and after the imple-

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mentation of the service test of the reinforced wing on 15 March 1953* the 58th Maintenance and Supply (M&S) Group was based at Itazuke to handle the function. Detachment No. 1, 8th Fighter-Bomber Wing managed another REMCO at Itazuke which serviced F-80, F-94, and T-33 aircraft, to which nearly all Korean wings furnished small increments of personnel.¹²⁸ In cognizance of the conversion of the 8th Wing to Sabres, Detachment No. 1, 67th Tactical Reconnaissance Wing, took over the F-80, RF-80, and T-33 REMCO at Itazuke on 16 March 1953.¹²⁹ The 17th Maintenance Squadron, augmented with personnel assigned by the 3d and 67th Wings, handled inspections and repairs at the B-26 REMCO.¹³⁰ The 4th and 51st Fighter-Interceptor Wings continued separate rear-echelon detachments at Tsuiki during most of 1952, but in September planning was begun for a Sabre REMCO which would accommodate four F-86 wings. On 15 November 1952 the 51st M&S Group assumed responsibility for the REMCO at Tsuiki, and effective 16 February 1953 the establishment was expanded to include the 4th, 8th, 18th, and 51st Wings. The 51st M&S Group continued to serve as the parent organization, with all participating wings assigning personnel to fill pro rata shares of the F-86 REMCO manning documents.¹³¹ At most of these REMCO bases the Japan Air Defense Force, as the host command, provided normal base support in the form of supply requisitioning, storage and issue, motor pools, and base shops, all such support being clearly outlined in joint responsibility agreements. The exception was Tsuiki, where the JADF had only a small detachment responsible for maintaining existing facilities and preparing construction programs.¹³² Here the 51st M&S Group, augmented by participating wings, was required to man and operate the base as well as to perform the REMCO duties.¹³³

The detailed organizational structure varied at each REMCO because of differences in available facilities and the number of wings supported. Except for variations resulting from jet engine repair, the basic functions were nevertheless quite similar. Under the REMCO concept all maintenance personnel over and above those required to perform preflight and postflight inspections,

*See pp. 169-72.

emergency engine changes, one-time repair of battle damages, and simple components replacements at the Korean bases were concentrated at the REMCO where, together with similar specialists from the controlling wing's maintenance squadron, augmented as necessary by other participating wings, they comprised a periodic maintenance section. Tools and equipment necessary to the REMCO were mostly drawn from TO&E authorizations of the wings, although some special issues were made. The employment of specialized dock, production line, or crew maintenance at the REMCO depended upon the availability of space and facilities, personnel qualifications, and the volume of work, but production line methods were found to be well adapted to periodic maintenance. Since the purpose of logistics was to support operations, maintenance planning was carefully based on operational projections, which, translated into flying hours, indicated the number of major inspections to be expected. A planning section at REMCO consolidated all of the inspection requirements submitted by the forward combat units and drew up a master schedule showing the number of aircraft to be delivered to REMCO per day. Each tactical unit received an individual schedule indicating the exact days on which its aircraft should be delivered to REMCO. While this scheduling was critical to successful rear-echelon maintenance, production control was rightly considered to be the nerve center of the REMCO. This unit not only monitored the maintenance effort status on each aircraft, but its work order planning unit made forecasts of parts and materials, based on individual aircraft records, in order that needed supplies would be on hand for technical order compliances and for components changes. Projected in advance, these parts were already on hand when the aircraft arrived at the REMCO. Projections were also made on aircraft engine consumption, so that enough built-up engines were always on hand.

Upon arrival at the REMCO from the forward base, aircraft were immediately given a shake-down inspection in an effort to find work that was needed but had not been included in the scheduled routine inspection. The inspector's work sheet was coordinated with production control while the aircraft was being cleaned on the wash rack. Production control then released a work order for the aircraft and made up instruction

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slips for necessary shop work. All work on the aircraft was recorded against this work order number. Minor field maintenance and repair of minor battle damage was accomplished during the inspection. An aircraft requiring major repair of battle damage or excessive shop work, however, was transferred to the field maintenance section of the REMCO. As soon as the work order was released, another unit of production control—materiel control—started to position that aircraft's needed components at the assigned dock position, or along the production line, and to obtain the materials needed for such other special requirements as had been noted in the shake-down inspection. The whole effort at the REMCO was so designed that, as in any efficient production line, parts, components, and materials would arrive at the place and time that they would be needed by skilled technicians.¹⁵⁴

For much the same reasoning as lay behind the centralization of maintenance activities, the Fifth Air Force centralized Air Force supply activities at the Miho, Itazuke, and Tsuiki REMCO establishments. In the winter of 1951-1952 the supply of parts and equipment for Thunderjets and Sabres became very critical. The major reason for this AOCF/ANFE situation could be attributed to USAF provisioning for new type aircraft under peacetime rather than wartime factors, but some instances were noted where Sabres were AOCF at one station for over a month when the needed items were in stock at an adjacent station. The major remedy for the problem area was the purchasing of war-level provisions for the new jets, but the Fifth Air Force also revamped its stock control and distribution system.¹⁵⁵ As a first step in this direction, it centralized base supply for F-84's at Itazuke and for F-86's at Kimpo, and as a safety precaution the latter stocks were transferred to Tsuiki in July 1952.¹⁵⁶ Each REMCO was subsequently assigned the responsibility for providing all aircraft spare parts and supplies peculiar to the aircraft it serviced. All such aircraft spares and supplies were taken from the base supply accounts and turned over to the REMCO base supply, which was charged with the responsibility for maintaining a 45-day stock level plus a pipeline requirement to the depot. To insure uninterrupted operations, however, it was necessary to have another level of supplies at the operating K-site. This responsibility was as-

signed to the organizational service stock, which maintained a 15-day stock level with a 10-day pipeline requirement for all items needed to support the particular aircraft assigned. Aircraft spares and items peculiar to the specific common stocks were obtained from the base supply of the base on which a unit was stationed. If an item causing an AOCF was not available in local stocks at the K-site, the service stock officer submitted a priority requisition to the REMCO base supply officer. If the item was not in stock at REMCO, a priority requisition was there submitted to the FEALOGFOR depot. The depot shipped the item to the REMCO base supply by priority transportation and it was there reshipped to the Korean base by priority transportation.¹⁵⁷

Even as eventually perfected, the REMCO system possessed certain disadvantages. To some commanders the whole REMCO system was repugnant since it denied them control over their maintenance. The time lost in ferrying aircraft to and from the REMCO, especially when extended by bad weather, detracted from the combat availability of pilots and aircraft. Concentrations of maintenance and supply at three bases offered lucrative targets to enemy air attack. It would also appear that personnel assigned to REMCO duty had difficulty establishing any esprit de corps. A morale study of the 8th Wing REMCO noted that officers and airmen felt little pride when they stated: "I belong to REMCO, Detachment #1, 8th Fighter-Bomber Wing." Instead, a current thought in this detachment was: "How the hell did I get in this outfit?" This same study, issued in November 1952, called attention to the fact that the bulk of assigned REMCO personnel were young men fresh from technical schools who failed to understand the importance of their jobs: all they could see was an endless flow of aircraft needing repairs and maintenance, and if they hurried and completed one job another aircraft would be along to take its place. Bitter disputes between REMCO personnel, who served 11 to 12 months' tours in the theater, and JADF personnel, who served 30 months at the same base, contributed to ill will, but this difficulty was eventually resolved when REMCO people were placed on the same rotational status as other airmen based in Japan. The assignment of personnel from several organizations afforded each unit an opportunity to reassign untrained, incompetent, or

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undesirable personnel to the REMCO.¹³⁸ The 4th Fighter-Interceptor Wing noted a certain reluctance on the part of its tactical squadrons to contribute enough people to the REMCO. The squadrons in this wing complained that the concentration of experienced mechanics and specialists at the rear echelon deprived newly assigned men in the tactical units of the benefits of association with seasoned technicians.¹³⁹

The system whereby aircraft supplies were controlled and stocked at the REMCO was not without its faults. Since the K-sites carried a slim level of supplies, good communications facilities for requisitioning and dependable air transportation for delivering critical shortages were prerequisite to a smoothly operating resupply system. Communications, however, were poor and handled priority supply matters with difficulty. Since approximately 95 percent of all aircraft support items consigned to organizations in Korea were shipped by air, Fifth Air Force supply was at the virtual mercy of events taking place in the 315th Air Division (Combat Cargo). Each time the 315th Air Division was assigned a theater priority task, or when a portion of its transport aircraft was grounded,* the closely figured Fifth Air Force supply system suffered. To an Air Materiel Command observer this state of affairs indicated a requirement for an air logistics airlift, probably assigned to FEALOGFOR, which would not have been subjected to withdrawal for other purposes.¹⁴⁰ Because of lags in communicating and transporting, the K-sites not infrequently had a slightly higher AOCP rate than did the REMCO stations. Held to a high operational rate in June 1953, and requiring three to four days to get AOCP requisitions from Tsuiki, the 8th Fighter-Bomber Wing had to resort to excessive cannibalization of aircraft parts at Suwon. In July 1953 the over-all Fifth Air Force AOCP rate rose from 2.9 percent in June to 3.69 percent, mainly because the grounding of all C-124 aircraft forced special requisitions to move by rail within Japan at the same time that local floods there hindered rail transportation.¹⁴¹

The advantages of the REMCO system of support to tactical operations nevertheless outweighed the disadvantages. Mobility of the forward "staging" bases was increased: had the combat wings been forced to move, they would have been

burdened only by a 15-day level of spares and a limited amount of maintenance equipment. Although the REMCO establishments presented potentially lucrative targets, security was actually enhanced by the system because heavy equipment, base supply stocks, and aircraft undergoing work were at some distance from the active combat area in Korea. The mechanical condition of combat aircraft improved, at the same time that maintenance work was done more quickly, more thoroughly, and more consistently. Increased maintenance output, derived from more efficient working conditions and better supporting facilities, meant a greater number of potential flying hours per aircraft. Consolidation of the technicians supporting the same type aircraft allowed closer supervision of the supply of critical parts, and logistic support requirements in the forward areas were reduced. Finally, the rear area establishments made good use of mechanically qualified Japanese personnel. At the end of the Korean conflict FEAF logisticians nevertheless recognized that REMCO had succeeded in no small part because of locally applicable circumstances: "Under the combat conditions existing in Korea," FEAF reported, "the REMCO system of support of tactical operations resulted in a more effective method of maintaining combat aircraft." Whether it would prove applicable in other overseas theaters would depend upon the local situation which prevailed at such time and place as the REMCO concept might be utilized.¹⁴²

Service Tests of a Reinforced Tactical Air Wing: As the culmination of post-World War II organizational planning, the USAF in June 1947 had published Air Force Regulation 20-15 which described the wing-base plan of unit organization. This wing-base plan, which was subsequently implemented throughout the Air Force, was designed to attain a standardization and stabilization of USAF organizations and to establish a centralized authority and a direct chain of command whereby one responsible wing commander would have supervision and control of the administration, logistical, and combat elements required by his mission. When the war began in Korea, the Fifth Air Force had been the first USAF command to test the new wing-base plan in combat, but for various reasons the Fifth Air Force never exactly followed the organizational dictates of AFR 20-15. Because it continued to have responsibili-

*See Chap. VII, pp. 298-97.

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ties in Japan, the Fifth Air Force initially chose to leave its regular table of organization wings at Japanese bases and to transfer the tactical group to Korea, where these combat groups were supported by table of distribution tactical support wings. Under the wing-base plan, the Fifth Air Force should have done just the opposite: it should have moved the table of organization wings to Korea and, to provide services in Japan, it should have organized table of distribution wings. On 1 December 1950, when it was obvious that the Korean fighting would continue somewhat longer than had been earlier anticipated, the Fifth Air Force corrected its earlier action by redesignating the tactical support wings in Korea as table of organization air wings, and it simultaneously organized table of distribution air base wings to operate the Japanese air bases.¹⁴³

After December 1950 the Fifth Air Force made conscious efforts to follow AFR 20-15, but a variety of situational factors prevented its exact application in Korea. The wing-base plan, for example, contemplated that one wing would be located on one base, but available airfields in Korea were so scarce that two or more wings generally had to locate on one base, with somewhat diverse deployment and organizational patterns. The 4th Fighter-Interceptor and the 67th Tactical Reconnaissance Wings endeavored to set up operations at Kimpo more or less completely, on opposite sides of the runway. At Kunsan the 3d Bombardment Wing operated the base as a parent wing, and the 474th Fighter-Bomber Wing occupied a tenant status. In another variation, the 49th and 58th Fighter-Bomber Wings operated from the same side of the airstrip at Taegu, and the 49th Wing served as the parent at Taegu and the 58th as parent at the rear-echelon base utilized by both wings at Itazuke. All combat wings conducted most of their maintenance activities at rear area bases in southern Japan. By June 1952, Brig. Gen. E. K. Warburton, deputy commander of the Fifth Air Force, was able to state that the USAF wing-base plan had proven inadequate for tactical operations in Korea. The existing wing-base plan contained too much command structure for the tactical effort in the wing, and tables of organization were relatively inflexible, requiring an excessive amount of time to modify them to meet changing conditions. The tactical situation in Korea required that wings operate from two

bases, one in the rear and one forward. One wing, however, did not have the capability for sustained operations from two bases without non-table of organization augmentation. It was possible almost to eliminate this requirement for special augmentation if the maintenance efforts of two wings with the same aircraft were consolidated at one rear base. Such a consolidation of F-84 maintenance was in progress at Itazuke, but most of the other rear maintenance detachments still retained their allegiance to individual wings. Some simpler organization was required that would get the maximum utilization of available personnel and equipment and reduce the indirect support effort at the forward and exposed air bases. On 22 June, General Warburton proposed that the Fifth Air Force would service-test a reinforced wing plan. General Warburton proposed that wing headquarters and maintenance activities would be deployed to a rear base and that two augmented tactical groups, each accompanied by an especially formed air base support squadron, would be deployed at one or two forward Korean airfields.¹⁴⁴

Much additional study and amendment followed the Warburton proposal, and the service tests of the reinforced tactical air wing would not begin before the late spring of 1953.¹⁴⁵ By this time, moreover, the course of events caused significant changes in the organization outlined in the Warburton plan. In January 1953 FEAF proposed to transfer the 49th Fighter-Bomber Wing, less the tactical group and two squadrons, from Taegu to the Japan Air Defense Force for station at Misawa.¹⁴⁶ The Fifth Air Force secured an abatement of this action so long as hostilities continued in Korea, but the 49th was nevertheless slated for transfer to the JADF at such time as it could be released in Korea. The Fifth Air Force was mindful of the projected transfer of the 49th Wing as it began to effect the organization of the reinforced wing at Taegu during March 1953. On 11 March it organized the 6156th, 6157th, and 6158th Air Base Squadrons, which were assigned respectively to the 58th Group, the 49th Group, and the 58th Maintenance and Supply Group. That same day the 58th M&S Group was moved with the 6158th Squadron from Taegu to the rear echelon station at Itazuke. On 15 March the 58th Fighter-Bomber Wing (Reinforced) took command at Taegu. After remaining on standby

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status for 15 days, the 49th Fighter-Bomber Wing and the 7th and 8th Squadrons were reassigned to Kunsan (K-8) vice the 474th Fighter-Bomber Wing, the 474th Fighter-Bomber Group, and the 428th, 429th, and 430th Fighter-Bomber Squadrons. Most of these transfers were paper transactions, in which existing units traded designations, but the 430th Squadron was physically moved from K-8 to K-2, this on 16 April 1953. The other paper transfers were announced effective 1 April 1953, at which time the 49th Wing was reassigned to the JADF with continued station at Kunsan. The 474th Wing and its units were reassigned to the Fifth Air Force.¹⁴⁷

As established at Taegu, the 58th Fighter-Bomber Wing (Reinforced) comprised the 58th and 474th Fighter-Bomber Groups, each with three squadrons of F-84 aircraft, the 58th M&S Group, and the 6156th, 6157th, and 6158th Air Base Squadrons. All other table of organization units were put on a standby status, but later the 58th Medical Group was made active to operate the base dispensary at K-2. Since the location of the wing headquarters and two tactical groups was not in accordance with General Warburton's original plan, it was necessary to decide how the two air base squadrons which supported the two tactical groups would be employed. For the sake of maintaining some semblance of mobility, the two air base squadrons remained attached to the two tactical groups, but it was nevertheless decided that the two air base squadrons should divide the air base functions: thus one squadron performed all food service, air installations, and air police activities at Taegu while the other performed all motor vehicle, supply, and communications functions. This reinforced wing organization represented savings of personnel spaces: instead of the 4,650 officers and airmen required by two separate tactical air wings, the reinforced wing was manned by 3,754 officers and airmen. Although hostilities continued only during the first four months of the test, this was enough time to indicate that the reinforced wing possessed operational advantages: whereas the two separate wings at Taegu had flown 1,986 effective combat sorties in February, the reinforced wing flew 2,165 in March 1953.¹⁴⁸ In the three months of April, May, and June 1953 the reinforced 58th Wing flew 10,442 effective sorties, and indicated its maximum capability when it twice mounted over 400 effective sorties on

15 and 16 June 1953.¹⁴⁹ This phase of the service test thus indicated that a greater amount of aerial firepower could be delivered by a single tactical air wing, reinforced to have two tactical groups, than by two wings which each had one tactical group.

The mobility of the 58th Fighter-Bomber Wing (Reinforced) was never tested in combat, but there was ample evidence that the movement of one of the combat groups and its attached air base squadron to a separate airfield would not have been feasible. The existing division of base functions between the two air base squadrons at Taegu made for nonhomogenous units, which could not support a tactical group at an advanced air base, and which when operating at Taegu, fractionated any unified command of base functions there. On 20 October 1953 the 58th Wing therefore abandoned the idea of mobility and deactivated the 6156th and 6157th Air Base Squadrons, whose personnel and equipment were used to form the 58th Air Base Group, comprising the 474th Supply Squadron, the 58th Motor Vehicle Squadron, 58th Installations Squadron, 58th Food Service Squadron, 58th Air Police Squadron, and 6156th Operations Squadron. The 58th Air Base Group was directly assigned to the 58th Wing, and the 58th and 474th Fighter-Bomber Groups were relieved of responsibility for their own housekeeping. As reorganized, the 58th Wing now required 3,834 personnel spaces and still represented personnel savings from the totals required by two separate wings. Sacrifices were also made of organizational test principles at Itazuke: the capability of the 58th M&S Group to accomplish its mission as a self-sufficient wing element at a separate base was not fully tested since the JADF's 6160th Air Base Wing remained responsible for much housekeeping support there, and most personnel of the undermanned 6158th Air Base Squadron was assigned for duty with functional elements of the 6160th Wing.¹⁵⁰

After the reorganization of October 1953 the service test of the 58th Wing (Reinforced) was continued to a final reporting date of 11 March 1954, and, in this period, the test evidenced a more efficient and economical utilization of USAF resources and developed more tactical effect than two wings located on the same base. The major result of the testing was to devise an organization which would satisfy the problem of operating two wings

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on the same base, but in the course of the testing certain subsidiary conclusions were noted. With relatively small augmentations to the wing staff, the command structure of a tactical wing was proven adequate to direct and control the base support activities of a forward base, the combat effort of two tactical groups operating from that base, and the requisite maintenance and supply support located at a rear area base. When one tactical wing operated two assigned tactical groups from the same forward area base, it effected economies in the utilization of air resources and gained operational efficiency. The optimum deployment was to locate both tactical groups on the same side of the airstrip: such a deployment admittedly increased the vulnerability of the base, especially to atomic attack, but with twice as many aircraft the wing commander had augmented defense forces at his disposal. Exposure to enemy attack, moreover, was inherent in tactical air employment. The assignment of an air base squadron to a tactical group permitted the group commander to do his own housekeeping but it impeded him in the

exercise of his primary tactical missions. When two tactical groups, each with an integral air base squadron, operated from the same side of an airstrip at a forward area base, there was a split control of base support functions which resulted in confusion, dissension, delayed actions, and waste. Experiences in Korea had shown that medical elements should be assigned as needed: in Korea, a hospital group was required at a forward area base, and this was especially true at a reinforced wing base. These were conclusions incidental to the service test. The major conclusion was that the 58th Fighter-Bomber Wing (Reinforced) had demonstrated efficiencies in management and in combat. On 11 March 1954, when he recommended discontinuation of further service tests, Col. Arthur C. Agan, Jr., commander of the 58th Wing, urgently requested that the reinforced wing be continued and preserved. "The present organization of the 58th Fighter-Bomber Wing (Reinforced)," he said, "is an eminently superior one for the employment of tactical air in a theater of operations."¹⁵¹

CONSTRUCTION OF AIR FACILITIES IN KOREA

Of all the requisites to the conduct of tactical air operations during the first two years of the Korean war, the construction and maintenance of air facilities had been most deficient. The lack of adequate facilities in Korea during the first two years of the Korean war had had a serious impact upon every phase of air operations. When they were required to fly from crude flight surfaces, the combat groups had been unable to carry the maximum ordnance loads which their aircraft were capable of lifting from adequate runways. Take-offs and landings from rough surfaces damaged and wore out combat aircraft, thereby posing an inordinate maintenance, supply, and replacement load upon the combat wings and the tactical air force.

The deficiency of air facilities in Korea sprang directly from a weakness of the engineer aviation capability, a matter over which USAF had slight control since such units were SCARWAF (special category Army personnel with Air Force) and were trained, manned, and equipped by the Department of Army. Because of notable failures of engineer aviation effort in the early months in Korea, USAF had established an Engineer Avia-

tion Force under its Continental Air Command on 10 April 1951. This force provided centralized direction for the operational training of aviation engineer units, and its work bore good fruits in the spring of 1952, but the matter of integrating engineer aviation troops into the USAF hung fire through the Korean hostilities.

In the first 12 months of the Korean hostilities, FEAF had concentrated every engineer aviation unit it possessed in Korea: two engineer aviation groups—the 930th and 931st—and five engineer aviation battalions—the 822d, 811th, 802d, 808th, and 839th—and one engineer aviation maintenance company—the 919th. By stripping other ZI units of critical equipment and getting limited amounts of equipment from current production, the Engineer Aviation Force had sent the 809th Engineer Aviation Battalion and 622d Engineer Aviation Maintenance Company to Korea in September 1951 while the 1903d Engineer Aviation Battalion followed in November 1951. In May and June the last of the principal units to be committed to Korea arrived: the 417th Engineer Aviation Brigade, the 934th Engineer Aviation Group, and the 366th, 840th, and 841st Engineer

Aviation Battalions. The 733d Engineer Aviation Supply Point Company arrived for assignment to the 417th Brigade on 9 March 1953. Not until June 1952—two years after the initiation of Korean hostilities—did the Fifth Air Force possess the engineer aviation capability which it required in Korea.

Arrival of the 417th Engineer Aviation Brigade for attachment to the Fifth Air Force on 17 May 1952 represented the filling of a long-standing need for some agency which could adequately supervise the construction of air facilities in the combat zone. In ordering, directing, requesting, and specifying requirements for construction, the Fifth Air Force through its Director of Installations represented USAF as the owner of the facilities. The engineer aviation brigade, acting in a parallel position of an architect-engineer firm, was responsible for checking all preliminary data, performing additional ground reconnaissance, preparing detailed plans and specifications, and issuing construction directives to the engineer aviation units. All plans and specifications prepared by the brigade were reviewed and approved by the Director of Installations before their issuance. The engineer aviation groups under the brigade acted in a parallel manner to civilian construction corporations, calculating quantities, preparing construction schedules, performing field and office engineering, staking out lines and grades, and maintaining a continuous inspection of all construction work being performed under their direction. Finally, the engineer aviation battalions performed field and office engineering as required in their duty of constructing directed projects.¹⁵² The 417th Brigade made a subdivision of effort among the three groups as follows in the last year of the war: the 930th Group was responsible for new construction or maintenance operations at K-1, K-2, K-3*, K-4*, K-5*, K-6, K-8, K-9, and K-37 airfields; the 931st had equivalent duties at K-13, K-14, K-16, K-18*, K-46*, K-47, and K-53 airfields; while the 934th remained continuously responsible for building the new air base at Osan-ni (K-55).¹⁵³ Engineer aviation battalions were shifted between groups as necessitated by the workload.

During the first year in Korea a lack of engineer aviation effort had permitted the Fifth Air Force

*These airfields were dropped from 417th Brigade responsibility in 1953, many of them being put in standby status.

to do no more than give rudimentary rehabilitation to old Japanese airfields, these improvements amounting in most cases to a resurfacing of existing flight surfaces with pierced steel plank (PSP), often with no consideration at all to the subgrade conditions. At best, the building of air facilities had been peculiarly difficult since the predominantly hilly to mountainous terrain is cut frequently by numerous braided streams which, narrow in the uplands, broaden to coastal flats only on the south and west coasts. Stream valleys and other reasonably flat terrain have been terraced and irrigated during centuries of rice culture, resulting in a high water table which makes subsurface drainage a major engineering problem. Thus available engineer capability could do no more than prepare and maintain minimum air facilities with a life expectancy of no more than six months. Not until April 1951 was the engineer capability great enough to expand construction programs and begin to build facilities designed to last as much as two years. On 28 June 1952 the first adequate flight surface to be completed in Korea, a 9,000-foot concrete runway at Taegu (K-2), was opened to all aircraft.

In June 1952 air facilities in Korea were thus still gravely deficient, and most of the existing flight surfaces were of such a polygenous composition, representing old Japanese surfaces as patched up and extended by various temporary expedients, that constant heavy maintenance was required. According to USAF concept engineer aviation battalions should be employed in new and heavy construction, which when completed is turned over for ordinary base maintenance to an air installations squadron integral to a tactical wing. Such, however, was seldom possible in Korea where more often than not battalions had to work continuously in maintaining and expanding the same airfield.¹⁵⁴ In the year following June 1952 and the completion of the buildup of aviation engineer forces in Korea, the Fifth Air Force nevertheless made substantial progress at its principal Korean airfields (see figure 16).

In the Seoul airfield complex were Kimpo (K-14), the Seoul municipal airfield (K-16), and Suwon airfield (K-13). As a result of remedial action begun earlier, a project of the 802d Battalion whereby Suwon's 9,068-foot runway was resurfaced with hot-mix asphalt was completed in June 1952.¹⁵⁵ Kimpo (K-14) had been the only pass-

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ably modern airfield in Korea when the war began, but two years of hard usage, combined with periods of Communist captivity and consequent UNC bombings, had left it in shambles. Only the longer of an original two runways survived, and its surface was so broken up and patched that at last it had to be completely resurfaced: beginning early in August and completing the task on 8 September 1952, the 811th Battalion resurfaced the old Kimpo runway with a 4-inch layer of hot-mix asphalt, working on half of the width of the strip at a time so that it was never closed to combat flying. So close was the tactical operation to the engineer work that aircraft wingtips sometimes clipped warning flags on construction equipment, but there were no accidents.¹⁵⁶ Although scant extension of the 6,000-foot runway was possible, directives were issued in early 1953 requiring construction of an 1,000-foot hot-mix extension at the northwestern extremity and the addition of 600-foot cement concrete overruns at each end of the runway. Although earthwork was complete in June 1953, these extensions would not be surfaced before the end of hostilities.¹⁵⁷ The Seoul municipal airfield (K-16) was located on the Han River flood plain just across from Seoul; here an original grass strip had been resurfaced with PSP and in the spring of 1952 the field was heaviest used by transports of the 315th Air Division (Combat Cargo). Between 29 July and 2 August Han River floods put the field out of operation. Already decision had been made to resurface the K-16 runway with asphaltic concrete with a design capability for supporting C-124 type aircraft. The 811th Battalion therefore first converted an existing taxiway into a temporary runway and then rebuilt and resurfaced the main strip with hot-mix asphalt, extending it in length from 4,500 to 5,650 feet in the process. This project was completed on 27 October 1952.¹⁵⁸

In the mountains of east-central Korea the Fifth Air Force utilized Kangnung (K-18), Hoengsong (K-46), and Chunchon (K-47) airfields. Like other small fields in central Korea these had been originally scraped out as advanced fields where transports delivered supplies to Eighth Army in the spring of 1951. Kangnung (K-18) now served the ROKAF with its F-51 Mustangs. Its 5,600-foot PSP surface required a welding project handled by elements of the 811th Battalion in July 1952, and in October 1952 an augmented company from the 809th Battalion rehabilitated the run-

way and taxiway, filling in weak spots in the base course, applying a dust palliative of rice bags sprayed with MC-3 asphalt, and replacing the PSP.¹⁵⁹ When the 6147th Tactical Control Group (Mosquito) moved up to Chunchon (K-47) airfield in the spring of 1952 its T-6 aircraft required some additional facilities. Although work was greatly hampered by 12 inches of rain in July 1952, the 809th Battalion completed rehabilitation of the 4,190-foot landing strip on 16 July 1952 and had a taxi strip ready on 17 August. These facilities were first surfaced with a tack coat of MC-3, upon which small stones or "fines" were spread and rolled, and then they were covered with PSP, the whole project being completed on 6 December 1952. The result was a satisfactory facility for T-6 aircraft, although it was recorded that the PSP became somewhat slick in wet weather.¹⁶⁰ Hoengsong (K-46) airfield was the advanced operating base of the 18th Fighter-Bomber Wing's Mustangs, and as such served the whole 18th Group during the latter half of 1952. After heavy rains and floods in July and August 1952, the original asphaltic surfacing displayed both cracks and base failures. In August 1952 the 809th Battalion had to move in and commence patching up the 4,800-foot runway at this "diminutive field," and this maintenance was completed on 26 November 1952 when the final seal coat was put on the runway. Early in 1953 Chunchon was placed in the hands of the 6155th Air Base Squadron which served as a caretaker after the departure of the 18th Group.¹⁶¹

On the south and southwest coasts of Korea were Pusan (K-1) airfield, Pusan East (K-9) airfield, and Kunsan (K-8) airfield. During 1951 Pusan (K-1) had been occupied by elements of the 1st Marine Air Wing, and when these Marine units moved to Pyongtaek (K-6) in the spring of 1952, the Fifth Air Force needed to keep K-1 for dispersal purposes in the event of increased hostilities. The principal project was to rehabilitate the old Japanese runway which had been hurriedly resurfaced with PSP in the spring of 1951. Removal of the PSP and renovation of the base course was handled by the 1903d Battalion, after which the 366th Battalion completed an asphaltic concrete paving job on the 7,000-foot runway on 27 September 1952. By this time another project of the same battalion was nearing completion in the rehabilitation of existing buildings, facilities, and utilities.¹⁶² No sooner was this work at K-1

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completed than the facility was needed, because at Pusan East (K-9) the original PSP surfacing, laid on an old Japanese airfield in the late summer of 1950, was badly deteriorated. The 17th Bombardment Wing moved its flight operations to K-1 on 30 September, and two weeks later the 366th Battalion began laying a 6,015-foot hot-mix asphalt runway and a 100 x 3,000-foot parking apron at K-9. The new runway was opened to traffic on 21 December 1952, and on the next day the 17th Wing returned to K-9. After approximately 30 days of operations, however, the runway surfacing at Pusan East began deteriorating so badly that it had to be closed several hours daily for patching. Close to 75 percent of the runway was eventually patched, so that in June 1953 it was necessary to lay a new 3-inch cover of asphalt over the entire runway. Although delayed by periods of rain and all-out light bomber operations, this task was nearing completion on 30 June.¹⁶³ At Kunsan (K-8) airfield arrival of the 474th Fighter-Bomber Wing from Japan necessitated construction in July 1952 of some 42 new hardstands by the 808th Battalion. A construction directive was also issued for a 9,000-foot cement concrete runway, but the work could not be undertaken for over a year because of a shortage of earth-moving and rock-crushing equipment. Finally, in September 1953, the 808th Battalion got to work and the new runway was opened in December 1953.¹⁶⁴

Movement of Marine Air Group 12 to Pyongtaek (K-6) airfield in the spring of 1952 necessitated construction at this old Japanese airfield since the 4,950-foot PSP strip which had been serving T-6 Mosquitoes was insufficient for Marine aircraft. The 1903d Battalion was directed to build an 8,000 x 150-foot cement concrete runway, with 500-foot overruns, together with a parallel taxiway and aprons. In the course of this effort five villages had to be relocated and paddy soil up to 15 feet deep in places either stabilized or replaced. Sufficient grading had been completed to permit the beginning of cement work on 31 October 1952, and at the end of December approximately 5,500 feet of the runway had been completed under cold weather precautions for batching and curing the cement. Since Kunsan (K-8) was crowded and F3D jets equipping VMF-513 seriously deteriorated the asphalt paving there, this all-weather Marine fighter squadron was moved to the new concrete facilities at Pyongtaek effec-

tive on 2 June 1953. At the end of June 1953 the new runway and taxiway at Pyongtaek were 94 percent complete, and an expected completion date of 15 August was posted for the accomplishment of the whole project, including appurtenances such as bomb dumps and interior roads.¹⁶⁵

During the Korean war only one major air base was built from the ground up, the other major bases representing rehabilitation and expansion of old Japanese facilities. The entirely new project was accomplished at Osan-ni (K-55) in the valley of the Chinwi-chon (river), about 40 miles south of Seoul. Here, in an agricultural region dotted with farm dwellings and small villages (four of which would have to be relocated), the Fifth Air Force directed construction of a two fighter wing base.¹⁶⁶ In December 1951 the 839th Battalion had begun building access roads, and at the arrival of the new engineer aviation units the 934th Group was placed in charge, with the 839th, 840th, and 841st Battalions assigned for duty, the last of them getting into place around 1 July 1952. Unlike any other base in Korea Osan-ni was to be built from a master plan to include: a 9,000 x 150-foot cement concrete runway with two 1,000 x 300-foot graded earth overruns eventually to be treated; a 9,000 x 75-foot concrete parallel taxiway; two 700 x 255-foot parking aprons; four diamond-shaped dispersal areas each with 20 hardstands; three 500 x 250-foot maintenance aprons; a warehouse area; a railroad line with two spurs; POL facilities for two jet wings; a road net; a surface drainage and dike system; two wing cantonments; and utilities to include sewage disposal, water supply, and electrical distribution.¹⁶⁷

The site at Osan-ni consisted of paddy land with underlying clay and silt saturated to a depth of at least 15 feet, the original surface being incapable of supporting heavy construction equipment. Since the site was quite level, drainage was difficult, but between December 1951 and March 1952 Korean contractors used hand labor to ditch and build flood dikes. On 28 July 1952, however, the Chinwi-chon flooded and backed up water to the runway grade, necessitating suspension of earthwork while new ditching and flood-gates were built. Construction of the runway and taxiway was assigned to the 839th and 840th Battalions, which had hardly gotten earthmoving under way before heavy rains required the evacuation of

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equipment to high ground. Work was recommenced on 4 August, but excessive rains and much deadlined equipment slowed its progress. All three battalions were now given various assignments on the runway and taxiway, each supporting the other with whatever equipment and operators they had available. The lack of spares, inexperience of operators, great amounts of precipitation, and the unstable subgrade made Osan-ni an unusually difficult project, but the battalions displayed high morale and an unbeatable willingness to cooperate. Paving started on 10 August 1952, work which progressed at one end of the runway while earth compaction went on out ahead of the pavers, and on 9 October the last cement was poured on the runway. After a slight delay for earthwork, paving of "C" and "D" dispersal diamonds began on 8 November, with work continuing against a deadline of 26 December when the 18th Wing was due to arrive. Cold weather required that batching water be heated and that calcium chloride be added to hasten the initial set, and after an area was paved it had to be draped with tenting and heated for the first 48 to 72 hours of curing. Under these emergency conditions the first two dispersal diamonds were completed on 24 December 1952. Two days later, on 26 December, Osan-ni (K-55) was officially occupied by the 18th Fighter-Bomber Wing, and in January 1953 the wing began transition to its new F-86F fighter-bombers.¹⁶⁸

Continued construction at Osan-ni was seriously impeded by extremely cold weather during January 1953, but late in the latter month early spring thaws softened road surfaces, which were churned into mud by vehicles and construction equipment. Weather conditions in March and April were very favorable, permitting completion of a good share of the work on service aprons and "A" and "B" dispersal diamonds before rain at the end of June again curtailed construction. Housing and other base facilities progressed rapidly in May and June, although certain electrical and plumbing material shortages held up housing projects. Where possible quonsets were substituted for tropical shell buildings, the latter being in short supply.¹⁶⁹ Although much work remained to be done, Osan-ni (K-55) airfield was progressing toward completion at the end of Korean hostilities.

Looking toward the eventuality of moving to a more secure area outside Seoul where its entire

headquarters could be concentrated, the Fifth Air Force in February 1953 directed rehabilitation of a former Japanese army compound at Yong-san, an installation which had been rather severely damaged by shellfire and ground fighting. The 840th Battalion, augmented by one company of the 809th, took charge of this rehabilitation effort, letting much of the masonry and roofing work to Korean contractors. At the end of June 1953 most of the building repairs were nearing completion, and an estimated completion date for the entire Yong-san project was set for 30 September 1953.¹⁷⁰

Although in the course of Korean hostilities flight safety was increased by the addition of length and overruns at the Korean airfields, jet aircraft continued to be lost when they overshot runways in landings and had difficulties in take-offs. Of 29 such accidents between 1 October 1951 and 31 August 1952, 14 were due to an inability to check the landing roll and 15 by failure to become airborne. The solution of this problem appeared to be some sort of an arresting barrier on the overruns, similar to those used on aircraft carriers. FEAF officers therefore visited the aircraft carrier *Princeton* in September 1952, noting that a version of the Davis barrier would probably be most suitable to their purposes. On 25 September 1952 FEALOGFOR was accordingly directed to devise such a barrier for service testing, and the pilot model was tested at Johnson Air Base on 6 and 7 February 1953. After its representatives viewed these successful tests, the Fifth Air Force directed that barriers be set up at K-2, K-13, K-14, and K-55. As built, these crash barriers comprised retractable stanchions which held the barrier in place, while heavy anchor chains (each link weighing 67 pounds) laid along the ground alongside the runway to provide the decelerating inertia when an aircraft struck the barrier. Such barriers were first installed near the ends of the short Kimpo runway and they successfully engaged two runaway RF-80's on 25 April 1953. In late April and early May similar barriers were built at the other fields. Study of costs versus results soon indicated the value of these installations: as built at Taegu (K-2) the two barriers cost together \$17,364 and in the first two weeks of their existence they saved three \$200,000 F-84 aircraft. On 16 May a bombed-up F-84 had a flat tire on take-off, hit the barrier at about 140 m. p. h., and was stopped with negligible

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damage. By December 1953 the barriers had been used 36 times by planes which had struck them at speeds of from 10 to 165 m. p. h.; 8 planes received no damage, 21 minor damages, and 7 major damages; one pilot was seriously injured and one received minor injuries. FEAF subsequently recommended that USAF install such barriers at its world-wide fighter bases.¹⁷¹

The flight surfaces at these Korean airfields were the critical facilities, dictating the combat load which could be carried by each airplane and having much effect upon aircraft maintenance, but they were only a part of the installations necessary to an operational air base. Since a jet fighter wing in combat operations consumed as much as 125,000 gallons of fuel daily and it was desirable to maintain a 5-day supply level on base, petroleum, oil, and lubricants (POL) facilities were a major consideration in Korea. The distribution of aircraft fuel from port to airfield was managed in the Seoul area by a pipeline from a terminal at Incheon, installed and operated by the Eighth Army's 82d Engineer Petroleum Company. While this pipeline was the most efficient conveyor of fuel in Korea, consumption at K-13 and K-14 not infrequently exceeded the supply, the controlling difficulty apparently being a shortage of terminal storage facilities at Incheon.¹⁷² Coastal airfields, including K-8, K-10, K-1, K-9, and K-18, depended upon water shipments for their fuel and their levels became critically low at times when tankers were delayed by mechanical failure or stormy weather. Inland airfields, including the major two wing base at Taegu (K-2) were served by rail shipments of POL; here it was found that it was impossible to maintain a maximum effort in excess of three days with the amount of railway tank-car support available.¹⁷³

POL storage facilities at terminals and at airfields were provided by 10,000-barrel bolted or 40,000-barrel welded tanks, the former proving acceptable for airfield use but too small for terminals. These tanks and POL equipment generally were in short supply, usually had to be back-ordered to the ZI, and often arrived incomplete or in nonstandard designs: during three years of hostilities, FEAF stated that the depots never received sufficient POL construction materials needed to meet all requirements.¹⁷⁴

Dispensing facilities for POL on the Korean airfields were greatly varied, for the most part

comprising mobile refueling equipment but including two experimental portable hydrant systems. As received in Korea these hydrant systems were expensive and complicated: they cost \$250,000 per squadron set as delivered and were composed of a large combination of bolted tanks, unitized pumps and filters, and aluminum pipe sections. Once installed semipermanently above ground, the system was not highly mobile. Base commanders at both K-13 and K-14 raised serious objections to the installation of such systems at their bases, alleging that they had no requirements (existing truck-trailers already could refuel aircraft faster than ordnance and oxygen could be serviced), that the systems were fire hazards and highly vulnerable to accidental damage, that adequate manning was not provided, and other such similar reasons.¹⁷⁵ For purposes of service test, however, one of these systems was ordered installed at Taegu.¹⁷⁶ As the 822d Engineer Aviation Battalion began installing the system in September 1952 it was greatly handicapped by a lack of trained POL personnel, and aluminum pipes were often found to have been dented at their ends in transit (a simple wooden plug would have prevented these shipping damages). When the system was first checked on 1 November it leaked so badly, principally at joints where aluminum pipes met cast iron fittings, that it had to be torn down and reassembled. Difficulty was next met when water drain valves froze and cracked, but the first system was turned over to the 49th Wing Air Installations Officer (AIO) on 24 December 1952.¹⁷⁷

Actual operations of the hydrant refueling system began at Taegu with a test run on 12 January 1953: with a hydrant and hose cart at each parking slot, an attendant had only to plug in the hose and turn on the fuel and could thus replenish a jet fighter in approximately 8 minutes from the time it was parked. Some difficulty was nevertheless met in clearing the hydrant system of water used in testing the lines, culminating on 30 January when the automatic water drain mechanisms froze, segregators did not function, and water was pumped into aircraft, forcing the 49th Wing to stand-down for two days. After this, the 49th Wing used its system for flight-line refueling of tank trailers, whose strainers and separators could be expected to operate effectively. By March 1953, however, the system was judged to be "proving highly successful" with the exception that rubber

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hosing was deteriorating in less than 40 hours usage and would have to be replaced with neoprene hose with a metal core which could sustain considerable pressure.¹⁷⁸ Final FEAF thoughts on the subject of the hydrant refueling systems were that they could quickly compensate for their high initial costs by savings in personnel and mobile refueling equipment; they were relatively safe and speedy in operation; lines and segregators, however, were subject to freezing. Fundamentally the system was not portable once it was installed, and FEAF recommended that the hydrant systems, as then designed, be installed and used only at semipermanent air bases.¹⁷⁹

For troop housing and shelter in Korea the Fifth Air Force utilized several different types of construction: tents, indigenous-contract built buildings, tropical-shell prefabs, and quonsets. The locally constructed buildings erected by indigenous labor contracts were generally 20 x 48-foot theater of operations structures with stucco or plaster sidings, roofed with corrugated steel or tar paper. These buildings were cheap and quick to build but they had a short life expectancy and required much maintenance. Large numbers of tropical-shell buildings were prefabricated in Japan: the basic building kit comprised a wooden frame, with corrugated iron or wooden sidings, and a corrugated iron roof. These prefabs could be erected in various configurations and could be winterized with a kit which contained insulation and plywood. These tropical-shell buildings were successfully used as barracks, mess halls, administration buildings, shops, and latrines, but, designed for a two-year life expectancy, they required considerable maintenance. The 934th Engineer Aviation Group noted that the lumber used in them was of such inferior quality that it was "a well-known fact that in erecting a block of tropical shells the first buildings to be constructed are in dire need of repair on completion of the last building on the same block." Quonsets, or steel prefabs, were extensively used in Korea; with a life expectancy of five years, these buildings required less maintenance than tropical shells but permitted of the same uses.¹⁸⁰ In the last year of the war, the Fifth Air Force found in storage at Okinawa, Guam, Clark Field, and Tachikawa a number of Butler hangars, and although their canvas was somewhat deteriorated one or more of

them were erected at Taegu, Kunsan, Suwon, Kimpo, and Osan-ni.¹⁸¹

Providing utilities at the Korean airfields was a matter much vexed by insufficiency of local resources and a wide variety of equipment used to make up these deficiencies. Sources of commercial electrical power in South Korea were limited and not dependable, requiring all bases to have stand-by facilities and K-55 to generate all its power. Average power consumption at most Korean airfields was from 300-500 kilovolt-amperes (KVA), more than could be readily furnished in a theater of operations. Generators were supplied in a variety of types and models, and this lack of standardization required a large and varied stock of replacement parts.¹⁸² The average air base area also demanded approximately 300,000 gallons of water each day, and again the major problem was the wide variety of pumps furnished by engineer procurement. At Kimpo water problems were always acute since, in addition to normal base consumption, the photo laboratories of the 67th Tactical Reconnaissance Wing pushed the average daily water requirement up to 500,000 gallons a day, the 67th Reconnaissance Technical Squadron alone, when working at top capacity, requiring 128,000 gallons a day. For its water Kimpo depended on the Noryong-Jim Pumping Station on the Han River, whose ancient pumps had been installed as early as 1926. Periodic breakdowns lowered water pressure and hampered photographic development, and only a partial solution was had when special storage tanks were erected to permit the 67th Wing an emergency supply. This solution proved practicable during the Korean hostilities, but it represented a calculated risk, a fact demonstrated in August 1953 when the Noryong-Jim station was flooded and put completely out of operation. During a period in August before repairs could be made water was brought to Kimpo by truck and was available only for drinking, cooking, and sanitary purposes.¹⁸³

That the problem of SCARWAF aviation engineer personnel was so acute in the first two years of the Korean war as to severely limit the air mission has been seen,* and again in the last year of the war unit effectiveness was still considerably reduced by the shortage of adequately qualified engineer aviation personnel. The year tour of

*AHS-71, pp. 4, 18; AHS-72, pp. 89-98.

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duty in Korea necessitated a constant flow of replacement personnel, but this flow was never maintained at an adequate or uniform rate, nor were the replacements adequately trained prior to their departure for overseas duty. "This deficiency," noted the commander of the 417th Brigade, "was the major deterrent to satisfactory operations within the Engineer Aviation units."¹⁸⁴

In the latter half of 1952 engineer aviation personnel losses ran greater than replacement gains until the end of December when the 417th Brigade received an influx of basic trainees with very limited experience, less than 2 percent being in the first three enlisted grades. Thus on 28 December 1952 the 417th Brigade was at 111 percent of authorized strength but had only 75 percent of its officer strength and only 36 percent of its authorized noncommissioned officer strength. The high proportion of basic soldiers (between 1 July and 31 December 1952, 86 percent of replacements were privates) and the lack of qualified noncoms made effective control and utilization of engineer aviation personnel very difficult. Within officer ranks there was a parallel lack of experience: as of 31 December a total of 293 lieutenants were assigned, representing 65 percent of the total proportion of officers assigned. Received as officer replacements in December were 110 second lieutenants, the majority being recent school graduates with no practical experience.¹⁸⁵

A slight remedial action was authorized by USAF on 21 November 1952 when FEAF was permitted to assign an absolute minimum of USAF air installations officers to engineer aviation units, especially to the maintenance companies which lacked the trained personnel they needed to keep machines operating. When the situation did not improve through Army resources, USAF on 11 February 1953 allotted 65 of its officers to fill the shortages, 48 of them arriving in the theater on 28 February.¹⁸⁶ In February USAF also allotted 623 airmen in the construction career field, the first increment of these men coming through the personnel pipeline to the 919th Engineer Aviation Maintenance Company in April. "Generally, these airmen had received excellent training," stated the 417th Brigade, "and . . . they performed well on engineer equipment."¹⁸⁷ In response to a Fifth Air Force appeal for more experience in the form of one colonel, three lieu-

tenant colonels, 30 majors, and 93 captains, USAF successfully obtained from the Corps of Engineers two lieutenant colonels, three majors, 10 captains, and 10 warrant officers for shipment on 27 April 1953.¹⁸⁸ These emergency actions alleviated but by no means assuaged engineer aviation personnel problems: as of 28 June 1953 the 417th Brigade was at 96 percent of authorized strength and had momentarily 94 percent of its authorized officer strength, but company commanders were generally second lieutenants instead of authorized captains. The noncom strength in the first three grades was only 29 percent of that authorized, and this was by far the most seriously felt personnel shortage. Most enlisted replacements received in the first half of 1953 had possessed limited skills and very limited experience.¹⁸⁹

As a consequence of these engineer aviation personnel difficulties the 417th Brigade had no choice but strongly to emphasize training. Continuous on-the-job training programs were conducted for vehicle and equipment operators, mechanics, surveyors, and other such skilled jobs, and wherever possible understudies were designated for platoon and section leaders. As soon as the men became familiar with fundamentals and the routine of their job assignments, and became a safe risk where safety hazards were involved, they were placed on their own further to qualify themselves on job assignments. Several specialized training courses of short duration were established to supplement on-the-job training (OJT). An engineer equipment mechanic (1319) course was established at the 622d Engineer Aviation Maintenance Company, while the 919th conducted diesel repairman (3013) and engine parts supply (1583) courses. The 822d Battalion ran a tractor scraper operator (3359) and a grader operator (3359) course. Every possible source of qualified personnel was tapped for training in these courses, until in June 1953 units were having difficulty filling their quotas, even though such training was sorely needed. These training activities assured units of having at least partially qualified personnel in most key positions, but the short tour in Korea after time in the pipeline was subtracted, the time consumed in placement and determining capabilities, the time required for training, and excessive wear and tear on scarce equipment almost precluded a justification for training engineer avia-

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tion personnel in the theater. By the time the new replacements were becoming skilled and proficient they were due for rotation.¹⁹⁰

Deficiencies in engineer aviation personnel skills were particularly noticeable in the operation and maintenance of heavy and costly equipment; thus local equipment and spare parts requirements in Korea ran far in excess of normal at the same time that the supply of engineer equipment and supplies was generally less than an acceptable normal. In the early part of the Korean war engineer equipment difficulties sprang from the large amount of World War II equipment still in units; beginning in early 1952 modern items were dispatched to Korea directly from ZI production lines; the net result was that neither category of equipment was adequately supplied with replacement parts and there were many models of equivalent items in use.* Compounding these supply difficulties was rough handling by untrained operators and lack of proper periodic maintenance by semiskilled mechanics, all of which added up to abnormally high deadline rates. Issuance of non-standard items of equipment greatly complicated both maintenance and supply. Each make required different maintenance procedures and tools, maintenance manuals, and stock lists. While the supplies required to repair equipment of a single manufacture were large in themselves, the stocking problem was multiplied to impossible proportions when several different makes and models of equivalent equipment had to be supported.

Supply procedures on engineer items, even in the spring of 1953, were slow: emergency requisitions, reported the 417th Brigade, could secure delivery normally within 3 days provided items were available in the theater, but normally requisitioned delivery of items in theater stocks required from 30 to 40 days and the time stretched out to 160 to 180 days if the items had to be back-ordered to the ZI. Considerable administrative difficulty was met in coordinating Air Force and Army procedures. In the ZI, SCARWAF units normally utilized Air Force supply procedures and stock numbers in requisitioning Engineer or Ordnance equipment and construction materiel. Procurement from Army sources was negotiated on the base and not the unit level. In Korea,

*At one time the 808th Battalion had 2-cubic yard shovels made by Lima and Bucyrus Erie and compressors made by Ingersoll Rand (2 models), Joy, and Davay.

SCARWAF units initiated requisitions utilizing Army procedures and Army stock numbers. From time to time, however, the Fifth Air Force requested reports of equipment and materiel under Air Force stock numbers, necessitating a tedious task of conversion.¹⁹¹ Recurring changes in supply procedures frequently compelled re-requisitioning of supplies with attendant delays, and the requisitions, making the long and tortuous journey from battalion to engineer depot, met different handling priorities at each echelon.¹⁹² In many instances personnel had to travel about the theater to find parts needed to keep equipment operational.¹⁹³

The engineer aviation supply problem was well illustrated by a situation which became acute in the winter of 1952-1953. Available as prime movers for earthmoving equipment were D-8 Caterpillar tractors and LeTourneau Tornadozers. Both by their nature and employment were subject to frequent strain and breakdown, and the latter had so many "delicate mechanisms" in the form of electric motors and switches as to be highly vulnerable to neophyte operators.¹⁹⁴ These machines had been frequently deadlined for want of spare parts throughout 1952: in April 1952, for example, the 839th Battalion successfully operated only 4 out of 9 D-8's and only 9 out of 15 Tornadozers.¹⁹⁵ At Osan-ni on 2 November 1952 only 18 out of 45 Tornadozers were operational, 17 of the total being deadlined for want of parts not available in the Far East.¹⁹⁶ And in early February 1953, over 65 percent of the Caterpillar tractors and Tornadozers were deadlined due to the lack of parts in the theater.¹⁹⁷

Since the entire airfield construction program planned for the spring months of 1953 was now jeopardized by engineer parts shortages, principally for earthmoving equipment but also for pavers, the Fifth Air Force sent representatives to the Columbus General Depot, Columbus, Ohio, to make an emergency requisition of engineer supplies. During April this project CRASH brought approximately 65 percent of the needed spare parts to Korea; those spares which did not arrive were delayed due to their purchase from manufacturers.¹⁹⁸ At the end of June 1953 the earthmoving capability was augmented by receipt of 30 additional Tornadozers, 14 to be applied to command shortages and 16 to replace repairable items.¹⁹⁹ Cognizant that a lack of maintenance

was running up the deadline rate on the engineer aviation equipment, USAF also took action establishing an Air Training Command course for ground equipment maintenance officers, supplemented by special training on Tournadozers, beginning on 1 May 1953. The 36 SCARWAF officers comprising the first class were to be dispatched to Korea on an expedited basis after completing the 40-day training course.²⁰⁰

In the performance of its base facilities mission the Fifth Air Force ultimately required 10 engineer aviation battalions, or a ratio of one construction battalion to one Air Force combat wing in Korea. By earlier standards this engineer force commitment appeared extravagant, but these standards had been rendered obsolete by modern aircraft. Gross aircraft weights had more than doubled since 1945, and jet aircraft tire pressures had increased from a former maximum of 80 to some 200 pounds per square inch. Existing design curves had anticipated an average of 3,000 landings on an airstrip per month, yet one Korean airfield averaged nearly 10,000 such landings in such a period. When the air was hot and thin, heavily loaded jet fighter-bombers demanded either long runways or jet-assisted takeoff (JATO), and a FEAF study established that "logistically and from a cost standpoint the extension of runways to 9,000 feet would be far more economical than to use JATO."²⁰¹

The new requirements lengthened the time required to build air facilities. To construct a 9,000-foot runway required about 4.5 battalion-months, compared with the World War II average of 1.5 battalion-months needed to build a 4,000-foot fighter runway. To build runways, taxiways, and parking aprons for a jet fighter group required 8 to 10 battalion-months, the building of a complete airfield thus requiring over twice the construction effort needed for the runway. If a runway was to be used by fighters, bombers, and transports, as was the case at most major Korean airfields, construction time was considerably increased over the 4.5 battalion-months required to build the simpler fighter facility.²⁰²

Having utilized pierced steel plank, cement concrete, and asphaltic concrete runways at its major bases, the Fifth Air Force had obtained valid cost factors associated with each of these surfacings. When the 9,000-foot cement concrete runway was finished at Taegu, the 49th Fighter-Bomber Wing,

which had also operated its F-84's from the old PSP strip there, made a careful analysis, noting: that the tire consumption was over five times as great on PSP as on concrete; that structural damage to aircraft, particularly wrinkled wings, damaged spars, and damaged leading edges, was less likely to occur on concrete; that a concrete runway presented less of a policing problem and reduced foreign object damage to jet engines; that concrete presented better traction for takeoffs, braking, or accelerating. In terms of cost, the initial construction of a cement concrete runway was less than that for PSP and required fewer man-hours for maintenance, but used-PSP could be salvaged and PSP could be more speedily repaired in case of bombing. In time, the construction of a fully operational cement concrete strip and a fully operational PSP strip was relatively equal, but a minimum operational PSP strip took some two weeks less time to build. Operationally, the cement concrete facility at Taegu fully justified itself: in July 1951, operating on PSP, the F-84's delivered 310 tons of ordnance in 625 sorties; in July 1952, from the cement concrete runway, they delivered 1,595 tons in 1,713 sorties. Extremely hot weather and heavy ordnance loads still necessitated some use of JATO in July 1952, but while it had cost \$2,976 in JATO to deliver a ton of ordnance against the enemy in July 1951 it cost only \$649 per ton of ordnance in July 1952.²⁰³

Much the same comparison between PSP and asphaltic concrete was made by the 17th Bombardment Wing in a study covering its operations of B-26 light bombers off the PSP at K-9 from 1 February through 30 September 1952 and off the asphalt runway at K-1 from 1 October through 20 December 1952. Although the PSP was in notably bad repair and the asphalt runway was just completed, and the cost comparison of an aging asphalt runway could not be computed, this 17th Wing stated that no structural damage to its aircraft could be attributed to runway conditions at K-1 whereas on the PSP at K-9 it had experienced tire blowouts, nose wheel collapses, and main gear failures. The wing averaged 48 landings per tire on asphalt as compared with 12.7 landings per tire on PSP. This factor was of special importance since the wing had experienced during 1952 a number of AOC's due to lack of tires and on one instance in July 1952 tires had been airlifted from the ZI to alleviate an especially critical

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situation. The 17th Wing study highlighted the fact that the asphaltic concrete runway represented savings in tire consumption, structural damage to aircraft, and in aircraft accidents.²⁰⁴

Further comparison of cement concrete and asphalt concrete runways demonstrated that the former, especially in an aging situation, had notable advantages. Asphaltic concrete offered a positive load-bearing capacity, its surface was durable, elastic, and easy to keep clean. Asphaltic concrete hot-mix, however, could not be laid in cold or wet weather, and specialized plant and paving equipment was needed. It was subject to deterioration by jet engine blast and fuel spillage, and if there was sub-surface failure asphaltic concrete would crack and rot. The asphaltic concrete runways at Kunsan and Pusan East (K-9) had been expensive to maintain, due chiefly to base faults and their having been laid in adverse weather. Cement concrete offered a positive load bearing capacity, was easily cleaned, weather resistant, was not damaged by jet blast or fuel spillage, and required minimum maintenance. Cement concrete could, with proper precautions, be poured at lower temperatures than asphalt could be laid. On the debit side, cement concrete required 21 to 28 days to cure before it could be used.²⁰⁵

At the end of Korean hostilities FEAF recognized as a major lesson that initial underestimation of airfield life expectancy need had resulted in excessive and often continuous reconstruction and rehabilitation costs. The result was that many of the engineer aviation battalions had not been efficiently employed on new and heavy construction projects but had rather remained in place maintaining and improving one airfield, thereby obscuring the intended delineation between the air installations and engineer aviation functions. Of all airfields in Korea, only Osan-ni (K-55) had been logically developed from an initial comprehensive lay-out plan. The lack of comprehensive planning and frequently changing priorities had greatly complicated the engineer work in preparing bills of materials and in concentrating labor and equipment where needed.

FEAF therefore stated the following lessons relative to a logical and orderly progression of construction effort in a theater of operations: prior to the initiation of construction of combat airfields consideration had to be given to the preparation of adequate sub-base and base courses

regardless of the type of surface to be used. Master plans for the construction of new airfields had to include provisions for siting the facilities so as to enable runways to be lengthened and the airfield to be expanded to meet requirements arising with new aircraft or a changing tactical situation. When there was a pressing operational necessity for a runway in the shortest possible time or when logistical support did not permit the mobilization of cement concrete equipment, PSP would be best utilized, provided always that recognition was given to the fact that PSP was a surfacing and required equivalent base courses as did asphalt or cement runways. For sustained jet operations, recognition should be directed to the fact that PSP runways would not be suitable. When time permitted, or as soon after completion of minimum PSP facilities as possible, runways should be built of cement concrete. When a runway had to be resurfaced and remain continuously operational, however, asphaltic concrete should be used, provided that warm-up aprons and runway ends should be of cement concrete.²⁰⁶

The Korean experience also demonstrated that the Air Force had a vital need for engineer aviation forces, which were not combat engineers nor construction engineers but specialists in the art of building airfields. Engineer aviation battalions were rich in equipment provided they were not overburdened with a conglomeration of makes and models as in Korea. The selection of equipment for assignment to an engineer aviation unit had to be made with a view to standardization upon types not only best suited for the work objective but which could be logistically supported. As specialists, the engineer aviation troops had to be given training designed both to sustain individual and unit proficiencies. More emphasis had to be placed upon the training of engineer aviation personnel destined for assignment to a combat theater, the training to be accomplished in the United States and designed to cover the operation and maintenance of the types of equipment in the unit to which the personnel would be assigned. Desirably, factory representatives would accompany major items of engineering equipment overseas. Absence of training on complex equipment and shortages of properly qualified engineer aviation personnel, FEAF noted, were the principal causes of engineer aviation ineffectiveness in Korea.²⁰⁷

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