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A N N E X C H A R L I E

TO

FOURTH

MARINE DIVISION

OPERATIONS REPORT

IWO JIMA

O P E R A T I O N S

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OPERATIONS

1. INFANTRY

(a) General.

(1) The amphibious assault on the island fortress of IWO JIMA presented a tactical problem different from any previously encountered by the Marine Corps, (except possibly to a limited extent at PELILEU) in that, after establishment of the initial beachhead, the attack inland continued to be opposed by heavily fortified positions organized in depth throughout the island. The initial landing was made on beaches composed of loose volcanic sand and backed by formidable terraces of varying heights which restricted the movement of tracked and wheeled vehicles inland. The defense-studded high ground on the right flank effectively covered the landing area and afforded the enemy excellent observation of the landing and the subsequent attack inland.

(2) Tactics displayed by the enemy in defending IWO JIMA were different from those employed in the defense of other island bases captured by this Division, in that, units were instructed to hold their positions until death and to conserve their forces with the mission of inflicting maximum casualties on our attacking forces. The enemy made skillful use of the rocky, rugged, jumbled terrain and from concealed, mutually supporting positions was able to deliver intense and accurate automatic weapons and mortar fire combined with sporadic and intermittent artillery and rocket fire throughout the operation.

(3) Within the Division zone of action, two phases of defense were encountered. The first phase consisted of a highly organized defense in depth of the landing beaches and airfields, utilizing, for the most part, concrete and steel pillboxes, blockhouses, and weapon emplacements. The enemy's defense during the latter stages was conducted from natural terrain irregularities, utilizing previously prepared caves and tunnels, rather than from concrete works.

(4) Nature of terrain and type of defenses encountered prevented maximum benefit being obtained from the fire power of supporting arms. The majority of the fortifications were of such strength that numerous direct hits of heavy caliber shells in the same place were required to breach the structure.

(5) Indirect artillery fire had little or no destructive effect on concrete blockhouses and pillboxes nor was it entirely effective against enemy personnel and weapons located in the labyrinth of caves and underground tunnels. Even under intense artillery

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fire, the enemy was still able to continue his mortar barrages and small arms fire. Naval gunfire achieved some destructive effect when employing AP ammunition and direct fire, but few targets could be so engaged from seaward. Air bombing, strafing, and use of rockets had little destructive effect on such well constructed and artfully concealed positions. Extremely tortuous terrain and skillfully designed anti-tank measures precluded effective use of tanks and 75mm half-tracks for direct fire missions against these emplacements, while the Bazooka and 37mm AT gun proved, in most cases, too light for the job.

(6) Thus, the infantryman, attacking in the open without full benefit of his usual supporting fire power, was pitted against imposing walls of concrete and steel and an intricate system of underground works.

(b) Tactics Employed.

(1) From the outset, the Division was committed to a continuous frontal assault against a series of strongly fortified positions. While constant attempts were made to flank or envelop enemy positions throughout the operation, the system of defense, employing mutually supporting fire from fortified positions, and the restricted area in which the Division was operating, prevented successful flanking action on a large scale. Thus, no recourse but frontal assault was open.

(2) The eastern portion of the Division's zone of action beyond the O-1 line consisted of a series of cross compartments running perpendicular to the direction of attack. These deep, fortified ravines extending from the high central plateau to the sea presented a formidable obstacle to movement toward the O-2 line and early in the operation requests were made to move the Division boundary southward to permit an attack down these corridors "with the terrain". Not until the latter stages, when the left RCT had advanced to a favorable position on the flank, was it possible for the right RCT to move down the ravines to the sea.

(3) In the assault of fortified positions, the following factors increased the difficulties of the problem and contributed to excessive casualties:

a. Unsuitability of terrain for the employment of heavy direct fire weapons, such as, the tank-mounted 75mm gun and the 75mm half track.

b. Relative ineffectiveness of artillery, air, and NGF against heavy installations.

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c. Lack of a suitable, portable, direct fire weapon capable of breaching concrete installations.

d. Mutually supporting nature of the majority of the fortifications, making attack by assault teams alone more costly than if heavy direct fire weapons could have been employed.

(4) The IWO JIMA operation emphasized the fact that the assault of a fortified position is a time consuming process that requires meticulous reconnaissance, planning, and preparation prior to initiation of the actual attack. The most important single factor in the success of the attack is the proper employment of heavy direct fire weapons executing slow, deliberate destruction of each enemy position. Artillery cannot be expected to destroy a great number of concrete pillboxes, blockhouses, and weapons emplacements, even though it be large caliber employing precision methods. Once a position has been neutralized by direct fire weapons, then, and only then, can assault teams attack the position with minimum casualties. Experience indicates that all infantry commanders from the battalion level upward must give more consideration to the planning and preparation phase before putting flesh and blood against concrete and steel.

(5) Again the enemy practice of "crowding" our lines in order to get out of our artillery and mortar fire was prevalent and, on many occasions, rifle and hand grenades were the only weapons that could be used effectively against such tactics. Accordingly, great emphasis was placed on the use of the rifle grenade, but more intensive training in the employment of this valuable weapon is indicated. A system of mass fires, four (4) men in each squad firing in battery, will be stressed in future training of the division.

(6) Because of the reduced size of units after the initial stages (many rifle companies were down to 50 men from a T/O strength of 240) and because of the rugged terrain which restricted visibility and limited fields of fire to a few yards, it was necessary to utilize more units in the line than would have been required on the same frontage in more open terrain. Physical contact was necessary, particularly at night, since gaps in the lines could rarely be covered by fire and this fact necessitated the employment of what may have seemed an excessive number of troops in the line, leaving very small reserves for all units. Against constant, heavy opposition in the type terrain encountered on IWO JIMA, it is considered that the commitment of fewer troops in the line to allow more rest for reserve units would have resulted in excessive infiltration, disruption of rear area activities, and additional casualties.

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(7) The by-passing of strong points in an operation of this type is considered undesirable. On only two (2) occasions were such tactics used on a large scale in the Division zone of action and it was found that both positions were difficult to reduce because of inability of the containing and mopping up force to employ heavy supporting arms. In more open terrain where defenses are not so concentrated, such by-passing tactics could be employed advantageously.

(8) During the early stages of the operation the enemy took advantage of our set pattern of beginning an attack by remaining in caves and emplacements during the preparatory fires, then appearing suddenly as soon as the attack jumped off. On the several occasions when pre-dawn attacks without preparatory fires were made, surprise was gained and good advances made, indicating that the decision to attack with or without a preparation must be carefully weighed in view of the factors involved. A standard routine of attacking at a certain hour must not be allowed to develop, but the procedure should be so varied that the enemy will be habitually caught off guard. The possibility of employing limited objective night attacks should be considered.

(9) The early loss of leaders and other experienced key personnel seriously affected the efficiency of small unit tactics. Assignment of untrained replacements did little to improve the situation and toward the end of the operation most small units were under command of personnel who had been placed in a position beyond their capabilities. Thus, the fact that leaders and key men must be adequately trained at least "three deep" was forcefully emphasized in the IWO JIMA operation.

(10) While retaining advantage of observation, the enemy consistently concentrated mortar, rocket, and artillery fires on CP's of all units, indicating the need for additional emphasis being placed on CP discipline and camouflage, particularly traffic control. When under constant enemy observation and conditions do not permit concealment of CP locations, it is believed the practice of small units occupying one CP location during daylight and then moving to an alternate location during the night should be considered.

(c) Infantry Weapons.

(1) No unusual employment of small arms was encountered during the operation. The BAR retains its place as a most dependable and popular weapon with the infantry. The carbine is valuable as a defensive weapon, but should be replaced in many instances by the .45 caliber pistol. The short bayonet was used by

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many units to replace both the long bayonet and the utility fighting knife. TSMG's are needed in the infantry battalion for mopping up work.

(2) The 60mm and 81mm mortar were employed effectively for close-in targets of opportunity, illumination, smoke missions, and counter-mortar fires. While these weapons were invaluable in their role, the need for a more effective mortar organization within the Division was indicated. The Japanese have many times the mortar fire power of a Marine Division, both in number of weapons and larger calibers, and on IWO JIMA it is estimated that a larger percentage of casualties to our own forces were caused by enemy mortars than any other weapon. Repeated recommendations have been made by the Division that the 4.2 chemical mortar, which has been tested and proven in combat, be adopted by the Marine Corps. A mortar battalion, consisting of two (2) 4.2 companies and one (1) 155mm mortar company, has been recommended as the ideal organization which would permit the assignment of one (1) 4.2 company to support each assault regiment while the 155mm company was held in general support under Division control.

(3) The 37mm gun and the 75mm half track, with which the Regimental Weapons Companies were equipped for the operation, were used infrequently because of the difficult terrain and the vulnerability of these weapons to enemy fire. The 37mm gun should be replaced by the 57mm gun in order to provide more adequate anti-tank protection. The M7B1, now replacing the 75mm half track, could have been used in the IWO JIMA operation as an indirect fire weapon when it was not possible to employ it in a direct fire role.

(4) The Bazooka was designed primarily as an anti-tank weapon and as such it has proven invaluable. For lack of a more suitable weapon, it has been used more frequently by assault teams as a direct fire weapon against fortified positions and caves. The need for a heavier direct fire weapon that could be carried by the assault team as a substitute for the Bazooka was keenly felt throughout the operation. It is believed that a rocket, embodying Bazooka-like characteristics but equipped with both a concrete-piercing and fragmentation shell, should be developed.

(5) Portable flame throwers were used extensively in assault work and in cleaning out caves. Their vulnerability to enemy fire and the difficulties of servicing make it mandatory that at least one (1) flame thrower be retained in reserve for each one (1) in use.

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2. AVIATION

(a) Support Aviation.

(1) Defensive air cover including antisubmarine patrol, was adequate and efficient from time of mounting until completion of assault phase. Preliminary air strikes were not sufficiently effective and the desired degree of neutralization was not obtained.

(2) On DOG-day, air attacks were delivered on the beaches and flanks prior to HOW-hour, and during the period H-55 to H-35 caused an apparent lull in naval gunfire, which was scheduled to continue uninterruptedly with a limited maximum ordinate.

(3) Air liaison parties operated under the supervision of unit air officers and commanders. Close liaison with naval gunfire and artillery teams was initially obtained by direct contact with their liaison officers in the landing teams. Requests for air support were forwarded over voice radio on the single channel available and later over land wires. Direction of air attacks was retained exclusively by CASCU, with whom radio communications were satisfactorily maintained throughout the operation.

(4) Communication between AGL teams and ASC was adequate; between ASC, support aircraft, and air coordinators apparently satisfactory; and between support aircraft and air support parties non-existent, although equipment was available.

(5) Targets were marked by white phosphorous and yellow smoke. Yellow fluorescent front line panels were used to mark front lines and appeared satisfactory to support aircraft.

(6) Air support missions were particularly effective when the heavier bombs with four-second-delay fuzes were used. In general, a lack of coordinated training of pilots with troops seemed to be responsible for inordinately lengthy dummy runs being made, adversely affecting effective timing and resulting in excessive intervals between origination of request and execution.

(7) Dummy attacks were the rule rather than the exception, preceding all close support missions; they were only rarely employed to cover an advance.

(8) Air liaison parties were not permitted to employ their VHF radios to control aircraft from the ground. This arbitrary limitation abrogated the tentative joint Navy-approved

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procedure which stated that air liaison parties would not be deprived of this privilege. Air liaison parties suffered heavy casualties working forward into positions from which to coach aircraft. Many air liaison officers available were former aviators, and six naval aviators were with the combat teams and Division Headquarters. Any objection to turning over coaching control to "inexperienced" air liaison parties is therefore not valid.

(9) The following comments and recommendations are tendered on their merits:

a. The planned air support did not provide adequately for exigencies such as might be reasonably expected from enemy action, nor did it provide the minimum number of aircraft for support missions stipulated in our previous battle operation reports.

b. Garrison fighter aircraft might have been employed earlier and more effectively for troop support missions if the pilots had trained with the Division.

c. Night air observers, repeatedly in demand by combat teams, should have been provided for in the Air Plan as recommended, and the subject given the widest dissemination; at least one air raid condition was caused partially by this omission.

d. Armament did not provide 2000-pound and heavier bombs despite prior requests and recommendations contained in previous battle operation reports.

e. Since no dive bombers were part of the support carrier group none were available to hit peculiarly defiladed enemy targets which artillery reported they could not reach.

f. Air liaison parties should not be deprived of the privilege of coaching aircraft onto the targets, if air support is to be close and effective.

g. Pilots of troop support aircraft should train with the Division.

h. White phosphorous was used by friend and foe, often with confusing and dangerous results. Yellow smoke shell at present has a poor ballistic design but with improvement, could more accurately be employed.

i. More data as to the allocation, number, armament, and type of aircraft, and times available.

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H-hour strikes should be made available by higher authority and the Division permitted to plan coverage of targets in the Division zone of action.

j. Strategic priority to water installations was advocated in our prior air recommendations, and apparently ignored. POW's stressed the fact that lack of water was losing the war for them on IWO.

k. The ordnance arming of carrier planes again proved too inflexible. Requests originated the night before for Napalm or specific bomb and fuzes were repeatedly ignored; or the present system is inadequate to effect the desired arming on reasonable advance notice.

l. Rehearsal air exercises were of little value to the Division. A minimum requirement should have provided for the air liaison parties being landed on KAHOOLAWA with sufficient troops to form front lines and display panels, while live ammunition was employed.

(b) Air Observation

(1) Plans and Preparations.

a. Training of Air Observers - Prior to the SAIPAN-TINIAN operation, twenty-three officers had received air observation training and over half flew in combat during that operation. Upon returning to Maui, training was continued and seventeen officers, ten of whom had had no previous training, attended a two-week course at Naval Air Station Kahului; a one-week course at Hickam Field; and a four-week course at Naval Air Station, Kaneohe. Two tactical observers received training at JICPOA, CINCPAC, and four artillery observers attended a two-week course at SOSU, Naval Air Station, Ford Island. Upon return to Maui, observers trained with VMO-4 and naval air units up to the time of the Division's embarkation. During the rehearsal period off Maui, fifteen observers continued training at Naval Air Station, Kahului. The Division Air Observer Group comprised: nine officers from the Artillery Regiment; one officer from each infantry regiment, the Fourth Tank Battalion, and the Division Reconnaissance Company; two officers from the First JASCo, and four officers from Division Headquarters.

b. Plans for Employment - Plans for employment of observers were designed to furnish tactical observation commencing immediately prior to H-hour on Dog-day; air spot for naval gunfire commencing on Dog-minus-three day; air spot for shore-based artillery to commence as soon as artillery was ashore and prepared

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to fire; night tactical observation, and special missions. Since the situation precluded use of OY-1 aircraft during early phases, it was necessary for the plan to be sufficiently flexible to take full advantage of observers based on carriers and other combat ships, and yet provide for the OY-1 aircraft to be shore-based with observers as soon as practicable. The plan was covered by Annex MIKE to Operation Plan No. 49-44, and provided for embarkation as set forth in the following table:

EMBARKATION TABLE

<u>Ship</u>	<u>Plane</u>	<u>Pilot</u>	<u>Mission</u>	<u>Observer</u>
USS CHESTER	VOS	Navy	NGF	1 Arty Obsr
USS SALT LAKE CITY	VOS	Navy	NGF	1 Arty Obsr
USS TENNESSEE	VOS	Navy	NGF	1 Arty Obsr
USS BILOXI	VOS	Navy	NGF	1 Arty Obsr
	<u>OY-1's</u>			
USS WAKE ISLAND	2	2 VMO-4	Arty Spot	3 Arty Obsrs
USS SAGINAW BAY	2	2 VMO-4		
USS MAKIN ISLAND	1	1 VMO-4		
USS BISMARCK SEA	2	2 VMO-4	Tactical	5 Tact Obsrs
LST #776	5	5 VMO-4	Arty Spot	2 Arty Obsrs
USS SARATOGA	TBM	Navy	Night Obsn	1 Tact Obsr

The five remaining officers who had received observation training were embarked with their respective units, prepared to fly on order.

c. Movement to Theater of Operations - During the rehearsal period at Maui from 3 January to 18 January, 1945, the fifteen observers assigned to combatant ships were temporarily attached to Naval Air Station, Kahului. The four observers assigned for naval gunfire spot departed from Maui 8 January, 1945, and embarked at Pearl shortly thereafter, while the remaining eleven observers departed Maui for Pearl 18 January, 1945. The one observer for night tactical observation, and the two observers assigned to LST #776 embarked at Pearl. The eight observers assigned to carriers departed Pearl by air on 21-22 January, 1945, arriving at Ulithi and embarking aboard assigned carriers on 25 January, 1945. On all combatant ships where observers were embarked, satisfactory liaison was established with the Air Department, Intelligence, Gunnery, Operations, and Communications. Aboard the USS BISMARCK SEA, arrangements were made for a receiver to monitor the SAO net and to make a transcription of all transmissions on that net. All observers made a detailed study of the operation plan and an intensive intelligence analysis of the theater of operations. The senior observer aboard the various combatant ships lectured separately to the air squadron aboard, all ship's officers, and to all ship's personnel on the landing force phase of the operation and the mission of air observation.

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Prior to the departure from Ulithi, four pilots and radiomen on the USS BISMARCK SEA had been specifically assigned to fly observation missions. They were specially briefed in all phases of the operation, and worked closely with observers while en-route to IWO JIMA. This trained pilot-observer team was of great value, and the observations of pilot and radiomen contributed materially to the observer's reports. No flights were provided for observers of this Division during the rehearsal at TINIAN.

(2) Activities During Combat

a. Naval Gunfire Spot - Air observers embarked on the four combatant ships commenced air spot for naval gunfire on 16 February, 1945, (Dog-minus-three day), and continued through 28 February, 1945, flying in OS2U's. Approximately 132 hours were flown in the execution of naval gunfire spot missions from OS2U aircraft, with highly satisfactory results. During subsequent phases of the operation, on several occasions, the tactical observers were employed to spot for naval gunfire.

b. Artillery Air Spot - From 20 February to 12 March, 1945, air spot for shore-based artillery was provided continuously by observers embarked aboard the USS WAKE ISLAND, flying in TBM aircraft. On 26 February, 1945, two OY-1's which had been embarked aboard the USS WAKE ISLAND, landed ashore at MOTOYAMA Airfield No. 1. Three OY-1's landed ashore from USS MAKIN ISLAND and USS SAGINAW BAY on 27 February; the remaining two of seven operational OY-1's landed ashore from LST #776 with two artillery observers on 28 February. Between 26 February and 4 March, four OY-1's were rendered unserviceable through enemy action in the shelling of the airfield; however, by 4 March, four OY-1's were again in operation. Artillery spot was continued with one TBM and generally with one OY-1 on station until the artillery was secured; however, two OY-1's were on station for two or three days from about 6 March, 1945. A total of about 470 hours were flown by artillery spotters on artillery missions which, combined with naval gunfire missions, totaled 602 hours.

From the observer's viewpoint, air spot was satisfactory. Base points and targets were easily located and registrations quickly made. Artillery observers airborne in TBM aircraft were greatly handicapped by the limited observation and difficulty of maneuvering.

c. Tactical Observation - Tactical observation commenced prior to How-hour on 19 February, 1945. Missions were flown in TBM aircraft from the USS BISMARCK SEA. Planes were armed only with defensive small-arms ammunition, no rockets being available.

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Two tactical air observers were to fly ashore from the USS BISMARCK SEA in OY-1 aircraft on Division order, leaving three tactical air observers aboard to continue observation in TBM's when carrier-based aircraft could operate ashore. The three tactical air observers aboard were to be shore-based, to continue observation in both OY-1's and TBM's. The night tactical air observer was to continue to operate from a carrier until ordered ashore. Supplementing the primary tactical air observers were the five officers who had received observation training and could be ordered to fly on order.

On the evening of Dog-plus-two, 21 February, 1945, the USS BISMARCK SEA was sunk by enemy action. The five tactical air observers aboard, and one OY-1 pilot were rescued later that evening, having been in the water up to three hours.

From 22-26 February, the Division was without its own tactical observation but immediately upon arrival of OY-1's ashore, tactical observation was commenced with secondary observers and one volunteer officer flying missions. Upon return of the regular tactical air observers, a definite schedule was maintained with tactical observation being furnished continually until the Division was secured. At that time, one OY-1 was operational and able to maintain observation flights. Only one tactical observation flight was flown in carrier-based aircraft from MOTOYAMA Airfield No. 1, a special mission for VAC.

One observer from Fourth Marine Division, one from Fifth Marine Division, and two from Third Marine Division were embarked aboard the USS SARATOGA for night tactical observation missions to commence D-day evening. It was hoped that day and night observation would be continuous. Five missions, totalling twenty-five hours, were flown by the night tactical observers through D- and D-plus-one evening; weather conditions and an air raid caused partially by faulty IFF, and an inadequate dissemination of the flight plan were factors hampering the success of this very much needed and new type of observation. On the early evening of D-plus-two, 21 February, the USS SARATOGA was subjected to an air attack and after sustaining heavy damage, was forced to retire from the theater of operations.

Several successive night, pre-dawn, and dusk-to-darkness flights were performed by tactical air observers in OY-1 aircraft. Ground troops report that enemy mortar and artillery fire was held to a minimum during darkness, when observation planes were kept on station. The presence of a plane overhead resulted in enemy forces being less willing to reveal their positions by firing.

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Heavy and accurate anti-aircraft and small-arms fire was received throughout the operation. Observation planes with Fourth Marine Division Observers were hit many times; one pilot being wounded and evacuated. The observer effectively piloted the aircraft from the rear seat after the pilot was hit, until just prior to the landing.

Although the enemy anti-aircraft fire was intense, all observers agree that our artillery, mortars, and naval gunfire constituted the chief hazard. To stay above the trajectory and get results was impossible, and there was no reliable way of tabulating when or where fire would be laid. With complete knowledge of trajectories at various ranges with various charges, angle of fall, and maximum ordinates for artillery, mortars, rockets, and naval gunfire, it was still usually impossible to judge which batteries were firing, and from what direction. It was therefore necessary most of the time to "feel one's way in", judging by nearby bursts, or by flying, when practicable, along the coastline of the island.

A total of about 260 hours was flown by tactical observers, of which 100 hours were in TBM aircraft and 160 hours in OY-1 aircraft.

d. Liaison on the Ground - Observers bivouaced with VMO-4 near the airfield, thus facilitating liaison. Continuous contact was maintained with Division Headquarters and the artillery regiment, and frequent visits were made to front line units. Communication with Division Headquarters was by radio and telephone.

e. Communications - The SAO net was used only for communications between SAC, Division Headquarters, RCT's, BLT's, and tactical air observers in TBM's. No difficulty was encountered on this net during the three days' operation by Division observers. To limit the traffic on the Fifth Division SAO net only Fourth Division Headquarters was permitted to transmit. The Reconnaissance Net, used with the OY-1's, included Division Headquarters, RCT's and BLT's. For a period of about two days, 4 and 5 March, sporadic enemy jamming was experienced and a frequency shift was made for one day only.

(3) Conclusions and Recommendations.

a. Consideration should be given to the advisability of organizing all tactical and gunnery air observers into a special section of Division Headquarters.

Observers with additional duties are not generally available for flying. At present, air observers are not

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included in the Tables of Organization for a Marine Division. All tactical and gunnery air observers authorized in Letter of Instruction #929, should be included in the Tables of Organization for a Marine Division.

b. Operation and Employment of OY-1's - It is recommended that all OY-1's be equipped and armed with six bazookas (rocket launcher 2.36" - M9A1) for purposes of accurately pin-pointing targets for support fires.

c. Operations in Carrier-Based Aircraft - It is strongly recommended that carrier-based observers fly in SNJ, SBD, or SB2C aircraft. The TBM is unsatisfactory for use as an observation plane. Its design restricts vision in the turret, to the port side; in the belly, to two small ports (approximately 18" x 12"); and in the greenhouse, by the wings, to directly ahead or astern. The TBM is not sufficiently maneuverable to keep a definite area under observation continuously, or for adequate evasive action. It is not suitable to fly at low altitudes over enemy installations for extended periods of time.

All observation planes should have dual controls to enable the observer to maintain the plane in flight and to land the plane in the event the pilot is hit.

Minimum allocation should provide eight tactical air observers with primary duties as follows: three night observers on night-operating carriers; three on one carrier for day tactical observation, and two observers as standbys aboard a third carrier in a separate carrier division.

A pilot-observer team for tactical observation should fly together in training and throughout the operation, moving ashore together.

During the operation, targets of opportunity discovered required immediate action and included active enemy artillery, rocket or mortar positions, and enemy troops concentrations. Inherent delays in the present system more frequently than not allowed the enemy to escape. The armament of observation planes, carrier-based, in the IWO operation did not permit taking these targets under fire even with permission of the Support Air Commander. On several occasions, air strikes went into targets located by air observers and were observed to miss completely. Had the observer led in the strike, better results might have been expected. It is recommended that observation planes be armed with half-explosive and half-colored smoke rockets to permit them to strike or mark targets. During the initial

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direct-support attack aircraft guarding the SAO net should operate with tactical observers to hit such targets of opportunity as are located, reported, and marked by observers.

(c) VMO-4 Operations

(1) Preparations.

a. In preparation for the IWO JIMA operation one officer, one enlisted man, and seven aircraft were sent to Guam in December, 1944. At Guam the planes had wings attached to the fuselages, engines checked, and were put aboard carriers for the coming operation.

b. On 31 December, 1944, twenty enlisted men embarked aboard the APA 207 at Kahului Harbor, Maui. On 4 January, 1945, seventeen enlisted men and one officer embarked aboard the APA 33. Fifteen men and one officer transferred from this ship to the LST #776 at Pearl Harbor. On 8 January, 1945, one Warrant Officer and two enlisted men, plus Squadron gear, embarked aboard the AKA 60 at Kahului Harbor, Maui, and sailed for Pearl Harbor. On 22 January, 1945, LST #776 sailed from Pearl Harbor; AKA 60 and APA 33 sailed from Pearl Harbor 28 January, 1945 - - all enroute to the objective.

c. On 22 January, 1945, six officers flew to Guam; here they were assigned aircraft. On 9 February, they flew their aircraft to Saipan and embarked aboard carriers on 11 February. Two officers and two planes went aboard the USS BISMARCK SEA; two officers and two planes went aboard the USS SAGINAW BAY; two officers and two planes went aboard the USS WAKE ISLAND; and one officer and one plane went aboard the USS MAKIN ISLAND.

(2) Flight Operations

a. In the evening of D-plus-2, the USS BISMARCK SEA (CVE 95) was sunk by enemy action. Of the two pilots VMO-4 had aboard this ship only one was rescued. Both of the Squadron's aircraft were lost.

b. On the morning of 25 February (D-plus-6), two officers and fifteen enlisted men came ashore and proceeded to MOTOYAMA Airfield No. 1. Signal equipment was immediately set up and radio contact was established with units of the Fourth Marine Division. The ground crew prepared to receive the first planes and to begin flight operations.

c. The following morning, 26 February (D-plus-7), two planes flew in from a carrier; the first American planes to

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land on IWO JIMA. Flight operations commenced on the same day. On 27 February (D-plus-8), the three remaining planes aboard the carriers flew ashore. This same day an attempt was made to fly one OY-1 from the Brodie Gear on LST #776. The hook failed and the plane went into the water; both pilot and passenger were recovered uninjured.

d. On the evening of 28 February (D-plus-9), a night mission was requested in order to locate, or hold down, enemy fire. Since it was experimental, only the pilot went on the mission. This was one of the first times that OY-1's had been used for night flying in combat. The flight proved to be of value to the division, and, therefore, more missions of this type were flown on following nights. The airstrip was not illuminated at night since the enemy still had observation of the field. A bad crosswind plus lack of proper instruments in the planes made night flying hazardous.

e. On 1 March, (D-plus-10), using an improvised releasing gear, the two remaining planes were flown off LST #776. The Squadron now had seven operating planes ashore.

f. Enemy artillery and mortar fire continued to fall on the airstrip while the Squadron was operating. Besides wounding one enlisted man, considerable damage was done to the aircraft. Two planes were damaged beyond repair and the remaining planes received damage necessitating immediate repair. On 2 March, (D-plus-11), one plane met with a mishap while landing. This accident put another plane out of operation, leaving only four operational planes in the Squadron.

g. On 5 March (D-plus-14), while flying a tactical mission, a plane was hit by enemy machine-gun fire and the pilot received wounds in the leg and arm. He was able to fly his plane back to the airstrip and made a safe landing. His wounds were such as to warrant evacuation and he was flown to Guam that day.

h. Bazookas, having been installed on one aircraft, were tested against KANGOKU Rock on 9 March (D-plus-18), using both antitank and white phosphorous rockets. Though performing satisfactorily, their use was never scheduled on IWO JIMA.

i. On 11 March (D-plus-20), the Fourth Marine Division Artillery was officially secured. Thereafter, the Squadron had no scheduled flights, but remained on call for tactical missions only. Flight operations were secured entirely on 17 March (D-plus-26).

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ANNEX CHARLIE TO 4TH MARINE DIVISION OPERATION REPORT, IWO JIMA.

i. During the nineteen days of Squadron operations against the enemy on IWO JIMA, this unit flew a total of one hundred and ninety-four (194) missions, accumulating three hundred and sixty-six and four tenths (366.4) hours. All missions were flown over enemy territory at altitudes ranging from ground level to one thousand (1,000) feet. The scheduled length of a mission was two hours; the average, one and nine tenths (1.9) hours, the discrepancy being frequently due to engine trouble while in the air, necessitating the return of the craft prior to the completion of the mission. Flights where no difficulty was encountered averaged a duration of two and three tenths (2.3) hours, the longest mission being three and two tenths (3.2) hours. During fourteen of the nineteen operational days, two planes were on station at all times from dawn to dusk; one plane flying an artillery spotting mission, the other flying for tactical observation. This rotation of aircraft presented a definite hindrance to proper engine upkeep, and was a contributing factor, along with enemy action, to the early depletion of operative aircraft. Enemy fire was encountered frequently while in the air. Some of the planes that were hit needed major repairs while others needed only minor repairs. No airplane from this unit was lost to enemy fire while on a flight.

k. Combat experience in the IWO JIMA operation demonstrated that the mere presence of a plane over enemy territory helped considerably in holding down mortar and artillery fire. Flights for this purpose were most valuable at dawn and dusk; that is, before support aviation was on station, and after it had been secured. Also, enemy mortar and artillery flashes could be seen better during these periods.

(3) Brodie Gear

a. The Brodie System, as used by this Squadron, might well be termed a failure. The initial trial in December, 1944, was unsuccessful, and resulted in the loss of one aircraft from VMO-4 and one from VMO-5.

b. One aircraft was lost at Saipan, on 14 February, 1945. This plane was attempting to take off. Investigation revealed the cause to be a faulty hook of the launching gear which was unable to hold the suspended weight of the loaded OY-1.

c. On 1 March (D-plus-10), two aircraft were successfully launched from LST #776. This was made possible by suspending the plane on the launching gear by the main hook used in landing, thereby rendering the pilot-controlled release ineffective. Release from the cable was effected by an emergency trip which released the five-foot suspension cable as well as the plane. In one instance this cable crashed into the canopy of the plane.

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ripping out the plexi-glass. This was a radical method of launching and is not recommended, except under emergency conditions.

3. NAVAL GUNFIRE

(a) Training and Planning for Operation.

(1) NGF personnel of the Division functioned together on numerous occasions prior to the operation. CPX's were held, both in camp and in the field, for battalions, regiments and Division. In addition all teams performed normal functions on maneuvers in the MAALAEA BAY area and on TINIAN ISLAND. This training is felt to have been fully adequate with the one exception that the late assignment of several of the NLO's prevented them from personally taking part in the majority of these exercises and becoming familiar with their teams and supported units. Teams conducted simulated problems with fire support ships assigned in direct support for the operation from positions ashore on TINIAN ISLAND. Some of the DD's to be employed on the operation took part in simulated missions with teams in the MAALAEA BAY area and actually fired missions for spotters on KAHOO LAWE ISLAND. No opportunity was provided for conferences aboard fire support ships.

(2) This Division was the instigator of a series of conferences among unit commanders and staff officers as to the proper employment, problems and potentialities of all supporting arms. NGF was well represented and particularly stressed at each of these gatherings. Following several Division conferences which thoroughly covered all general aspects of the problem, individual units called on their own liaison officers to carry the principles along to individual members of their commands. All unit commanders appeared to be vitally interested in these conferences and it is felt that constructive steps were taken in bringing about a more thorough understanding of the proper employment of NGF throughout the chain of command. All NLO's kept their commanding officers and staffs well informed and abreast of the situation relative to NGF, day to day.

(3) The method of coordinating Artillery, NGF and Air support was accomplished in lower echelons of this command through the medium of conferences involving all three liaison officers and the operations officer or commander of the unit involved. On the Division level particularly close contact was maintained between the NGF officer and the operations officer of the 14th Marines. Through personal contact and telephonic communications NGF and Artillery kept well aware of each others activities. This usually took care of coordination with Corps Artillery also. The Coordination and cooperation of the 14th Marines with NGF was particularly

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helpful and gratifying throughout the operation. Personal contact was always present between Division NGF and Air officers. Each kept the other informed of his activities and coordination in the Division was good. However on several occasions NGF was not notified in sufficient time of air activities planned by higher echelons. This brought about several instances where ships were still firing when planes came in, simply because warnings had not had time to be sufficiently distributed.

(4) Division NGF was kept fully abreast of the situation throughout the operation by the D-3 section. Particularly close liaison was maintained between NGF and D-3 as they occupied adjacent sectors of the same dugout. All lower echelons reported that unit commanders kept them fully advised of all operation plans.

(5) It is felt that too much cannot be done in the furtherance of the coordination conferences between units and liaison officers of supporting arms. Excellent steps were taken prior to this operation but it is impossible to have too close an understanding between infantry units and supporting arms. This must go down as far as the individual riflemen. In the final phase of training for any operation SFCP teams must work closely with units which they will support. It is recommended that on future operations radio exercises with fire support ships at the advanced staging area be conducted with SFCP teams aboard their respective ships, thus incorporating the excellence of the exercise and precluding any chance of loss or damage to equipment at such a late date. If possible all fire support ships to be employed on an operation should take part in all preliminary operations and maneuvers. It is also highly recommended that in future operations conferences aboard direct support ships be arranged for all SFCP teams involved.

(b) Observations on Effect of Scheduled NGF.

(1) It is estimated that approximately ten percent (10%) of the beach defenses were knocked out and all enemy troops neutralized by scheduled bombardment in RCT 23 zone of action. Destruction was principally accomplished by heavy caliber shells. High velocity guns were not knocked out on the flanks and automatic weapons from emplacements along abutments of the airfield to the front were active. Mortars from the flanks and reverse slopes exacted heavy casualties on the beaches. Construction of emplacements, in conjunction with terrain, rendered area fires largely ineffective, although observation revealed it possible to close small caves with 5" projectiles. Directed fire from 5" batteries proved to have little effect upon the area surrounding the 11382. In RCT 25 zone of action large pillboxes on beach were knocked out

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by heavy caliber fire prior to the landings. Effect of 5", rocket and mortar fires on beaches was not visible due to the sandy nature of the beach. The rolling barrage screened initial waves sufficiently to enable them to organize on the beach but enemy riflemen had held their positions and were able to fire through the barrage from the right flank. Most emplacements observable from seaward were destroyed and the fire received came from reverse slopes and emplacements further inland.

(2) With the terrain and type defense employed by the enemy on this island, area coverage loses almost all value. All fire must be pin-pointed on targets if destruction is to be obtained. The pre-Dog day bombardment was far too brief to enable any ships to definitely locate many targets, let alone destroy them. Bad weather, coupled with brief time allotted, permitted ships to fire through areas only. In the operation two facts were obvious: (1) far more and heavier fires were needed on the flanks in depth, and (2) the rolling barrage was an excellent instrument in neutralizing areas but did little destruction. The reduction of enemy strong points and the total destruction of the bulwarks of defense must be accomplished in a carefully planned and more carefully executed pre-Dog day bombardment.

(c) Call Fire Phase.

(1) The present organization and doctrine for call fires is considered satisfactory.

(2) Every attempt was made throughout the operation to maintain coordination between adjacent units. Units communicated with one another and discussed their respective situations. No unit fired into another unit's zone of action without the specific permission of the commander of the unit involved. A close check was maintained at all times of front line positions of all units and the line of fire of each ship was kept under constant surveillance. Effectiveness of coordination in illumination was particularly stressed in the latter stages of the operation due to limitations on number of star shells available. Here one ship illuminated for as many as three units. Higher echelon coordination proved particularly effective. The 5th Marine Division proved themselves especially cooperative at all times in assisting our advance by promptly taking under fire any areas in their zone which were holding up our advance. Similar cooperation was obtained from the 3d Marine Division. All involved reacted promptly on all reports of starshell cases or short rounds and the number of instances of both were at a minimum.

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(3) Approximately 750 call fire missions were fired by units of the Division on the operation. Roughly 20-25% were fired by spotters, 50-60% by air spot, 5% direct fire and the remaining unobserved fires. Results obtained were generally good. In most instances neutralization only was obtained. Due to the nature of terrain over which the Division operated air spot was invaluable.

(4) Deep harassing fires were employed at night, mainly as counter-battery measures. Little destruction was obtained but almost invariably these fires would force enemy guns to cease firing. Some interdiction fire was also employed.

(5) On one occasion call fires were brought within 100 yards of friendly troops. In this instance a spotter was aboard the firing ship and communications with front line units were excellent. Fires were walked to within 200 yards of friendly troops on several occasions and as a rule NGF was employed as close as 400 yards. The 1200 fs ammunition was mainly responsible for these close supporting fires. Ships capable of efficiently employing this type ammunition proved excellent supporting units and it cannot be too strongly urged that 1200 fs ammunition be used during the major portion of all future shore fire bombardment exercises.

(6) Air burst was not extensively used due to the fact that the enemy was seldom caught in the open. When employed it was very effective. WP was used principally for marker salvos. Some units mixed it with HE and recommended its further use in such a manner. Rockets and mortars were especially adaptable for large area coverage in night harassing and interdiction fires. Forty and twenty millimeter fires were used mainly along the coast firing up draws and into caves. They were very satisfactory in this assignment. On several occasions spotters went aboard destroyers and fired forty millimeter along the coast.

(7) When air spot was employed the SFCP was on the same frequency with the plane but usually was unable to contact the plane by radio necessitating relaying of all messages through the firing ship. It was the consensus of opinion in the Division that due to the nature of the terrain air spot was indispensable. The continued employment of VOF spot planes is most strongly recommended with even larger numbers available for each operation if possible.

(d) Fire Support Ships.

(1) The relief and assignment of ships worked out excellently on the operation. The one difficulty encountered was the

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fact that on occasion ships were assigned later than desirable in the day. The principle of all reliefs being made prior to 1600 each day should be adhered to as much as possible. When additional ships were required higher echelons proved particularly cooperative in securing them if they were available. During the closing phases of the operation there were not enough ships made available to provide proper illumination.

(2) All ships proved cooperative and delivered prompt, effective fires. Some were rated as excellent and others as less so, but all were generally satisfactory. All appeared eager to do every thing possible for SFCP's. In several instances spotters were able to coach ships onto targets in order that they might employ direct fire methods.

(3) This Division continually employed one or more gunboats along the coast on the right flank. Their use proved very effective, particularly in the early stages of the campaign when a spotter from the right flank battalion spotted fires from the flag gunboat. It is believed that in future operations it would be well worth while for units operating along a coast line to so employ a spotter. This Division used a replacement spotter for this mission until casualties ashore forced his recall. The work of all types of gunboats was especially commendable throughout the operation.

(4) In the early stages of the operation a Division general support ship was assigned the Division and excellent use was made thereof. The ship was instructed to come up on the Division NGF Common net and was employed in deep support, emergency missions and with air spot on observed targets in the Division zone of action. Assigned to the Division for two days the USS SANTA FE proved extremely cooperative and continually functioned in a highly efficient and effective manner at the most trying stage of the operation. At one time this ship was in communication with a battalion spotter, a battalion liaison officer and the Division NGF officer and was simultaneously illuminating, firing cell missions and maintaining a harassing schedule in a most capable manner. It is recommended that plans for all future operations include a general support ship, preferably a cruiser, assigned to Division both day and night. The lack of such a ship was severely felt later in the operation.

(e) Scheduled Fires During Continuation of the Attack.

(1) The extreme difficulties of the terrain which were continually encountered in the Division zone of action rendered preparation fires less effective than is normally expected. However

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neutralization was obtained in almost every instance.

(2) Harassing and interdiction fires with NGF were held to a minimum whenever the areas could be covered by artillery. As fired they were reported as very effective. Mortar barrages were particularly adaptable for these fires.

(3) Due to the fact that the enemy took every possible advantage of the abundance of natural cover and concealment, and reinforced his positions with the strongest type of fortifications, counter-battery fires in our zone of action did not prove effective to the goal of destruction. Batteries were silenced through neutralization but it was impossible to knock many of them out since no direct line of fire could be obtained.

(4) In terrain of this type, fires must be placed on pin-point targets rather than in areas. Air spot is virtually the only successful means of observation. Destruction of targets, while still sought after, is not to be expected in too many instances unless a line of fire is available to allow the ship to employ direct fire.

(5) Star shell illumination was the only type employed by this Division. In the late stages of the campaign arrangements were made for searchlight illumination along coastal areas to the front, but such steps were never taken as the situation changed shortly thereafter. Coordination of illumination between Divisions consisted of passing on to Corps, and to each other, positions of ships and line of fire to be employed. On occasion when lack of illumination or point of illumination was detrimental to an adjacent unit, adjustments were quickly made. The Division attempted to hold the rate of fire for star shell illumination to one round every ten minutes except in cases of emergency. This rate is believed to be adequate, even though it was often exceeded due to the night infiltration tactics of the enemy. All units place star shell illumination above all other methods available and no casualties were reported in the Division from star shell cases.

(f) Effectiveness of SFCE Personnel.

(1) The number of personnel supplied to Division and regimental teams is the minimum number for manning necessary nets and radio sets. At least two more radio operators per team could be gainfully employed. These teams were enabled to function efficiently on this operation through two expediciencies; the use of radar beacon men as watchstanders on radio nets and the early cessation of the Division NGF Common net due to heavy losses in

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radio materiel suffered by regimental and battalion teams. The number of personnel furnished battalion teams is believed to be sufficient, particularly when it is borne in mind that these teams must be extremely mobile. It is felt, however, that a number of trained personnel should be held in reserve for these teams as replacements, since casualties must be expected to run high in assault battalion teams.

(2) Due to the fact that the majority of SFCP personnel of this command have operated together on several operations, the status of training could be called very adequate. Among some of the newer personnel there was a lack of sufficient training in radio materiel and infantry tactics. This can be mainly attributed to the late assignment of many of these men and officers to this unit prior to the operation and can be adequately dealt with before again moving into combat. It is felt that a communications officer of warrant or commissioned rank would prove extremely valuable as officer in charge of technical communications training of NGF personnel. During operations he would act as officer in charge of communications with the Division team.

(g) Equipment.

(1) Communication equipment furnished for the operation was sufficient and adequate. Facilities for replacement of equipment, parts, repairs, etc. were adequate, largely through the cooperation and efforts of the communications officers of the units to which SFCP teams were attached.

(2) It is recommended that the SCR 694 replace TBX and SCR 284 sets. If this is impossible arrangements should be made to provide a quieter generator for the foregoing sets. Each assault battalion should be provided with an SCR 300 channel. This is essential to early communications. All battalion teams should have crystals installed in SCR 536 sets on the same frequencies as fire support ships. These little sets, so equipped, proved life savers in the initial confusion and disorganization on the beach.

(3) The Radar Beacon was not used by SFCP units of this Division. Four beacons were taken ashore. One was lost on the beach from enemy action; another was being put in operation when it was knocked out by enemy fire; the other two were not used at all. The terrain did not lend itself to the use of this line-of-sight beacon, and when finally high ground was gained, firing was in limited areas. In exercises conducted prior to the operation the beacons were successfully employed, however, and their use is recommended in any terrain permitting proper line-of-sight.

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(4) Equipment other than communication proved adequate.

(h) Operational Features.

(1) The practice of SFCP-officers going aboard destroyers and actually spotting fires into enemy installations proved very valuable on this operation since in many instances the deep ravines in which installations were located opened to the sea and could be observed by the experienced eye from seaward.

(2) The time allotted for pre-Dog day fires was much too brief to allow sufficient accurate, destructive fires to be placed in vital areas. NGF on and after Dog day is rated as excellent, bearing in mind that the extreme difficulty of the terrain rendered destructive fires impossible in the majority of instances.

(i) General Recommendations.

(1) It is believed that the presence of at least one NGF spotter aboard a free gunboat is the solution to the problem of control during the unstable ship-to-shore period. Spotters so situated can control fires even more capably than personnel in free LVT's, as heretofore attempted, and in addition can furnish invaluable assistance from the seaward along the flanks after the SFCP has established itself ashore.

(2) The numerous changes in firing ships necessitated by changing situations between the time of conception of an operation plan and the time of landing lends to the general confusion of last minute corrections. It is therefor felt that the assignment of fire support ships by type rather than by name, would lend itself more readily to the planning of NGF. (Example: DD-1, DD-2 instead of LEUTZE, McCALL). An up-to-date list of ship assignments would have to be furnished units at regular intervals.

(3) In order to obtain the accurate, destructive fires necessary in the pre-Dog day bombardment it is felt that the presence of experienced SFCP officers aboard ships assigned to sectors in the Division zone of action is desirable. The Division recommends that Naval liaison officers and spotters of the initial Division reserve be placed aboard cruisers and battleships assigned to the Division zone of action in the pre-Dog Day bombardment. Arrangements could be made for the transfer of these officers to the Division control vessel the morning of Dog-day. It is further recommended that these officers be empowered to direct the fires of ships against enemy installations and areas which they are able to observe, or have spotted on maps and photos. A close coordination between these officers and ships' spotters is deemed very

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advisable, and complete cooperation with Landing Force gunnery plans necessary.

4. ARTILLERY

(a) Standard artillery tactics and doctrine were employed in the IWO JIMA operation and proved adequate and sound. Experience gained in this operation indicates that improvement in execution of existing doctrines and the adoption of new techniques must be a continuous process.

(b) According to the standard operating procedure for the Division, Division artillery landed as a unit and no attachment to infantry units was made. This scheme of landing again proved to be sound, particularly in view of the difficult beach conditions during the initial stages. Normal direct support assignments were followed throughout the operation.

(c) The reinforcement of Division artillery by the 155mm Howitzer Battalions of Corps Artillery was satisfactory, except that during critical periods additional corps artillery would have been highly desirable. It is considered that the minimum corps artillery in support of three Marine Divisions should consist of four 155mm Howitzer Battalions in order to provide one reinforcing battalion per division, permitting the remaining howitzer battalion to be used in general support. The nature of the terrain encountered on IWO JIMA made the high-angle features of the 155mm Howitzer Battalion highly desirable in reaching defiladed positions, and it is believed that 155mm guns, now constituting the corps artillery organization, would have been unsuitable for the mission of reinforcing division artillery. Attention is invited to the fact that the primary mission of corps artillery is to reinforce the fires of Division artillery, which, even in its present organization of three 105mm Howitzers Battalions and one 155mm Howitzer Battalion, represents minimum artillery requirements to support a marine division in an attack against light or average resistance. Normal concepts dictate that division artillery must be reinforced by several battalions of corps artillery howitzers in order for the division to accomplish its mission in operations against heavier than average resistance.

(d) High-angle fire was executed several times during the operation but experience proved that in terrain with limited visibility this type fire is harder to control and cannot be brought in as close to front line troops as normal low-angle fire.

(e) For detailed operations of 4th Marine Division artillery, see Annex Item, Division Artillery Report.

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5. TANKS

(a) Tank companies were attached to RCT's in the normal manner for landing, each company being embarked in three LSM's. This method of landing in LSM's, in view of the beach conditions, proved exceedingly satisfactory. Some difficulty was experienced in getting the information from tank reconnaissance parties back to RCT commanders and tank units prior to tanks landing. Additional training, reorganization of tank reconnaissance personnel, and the establishment of a standard procedure for tank reconnaissance is indicated.

(b) The rugged, jumbled terrain encountered in the Division zone of action precluded maximum use of tanks in support of infantry. Under similar conditions in the future and after intensive training in field artillery methods, tank units will be able to support the attack with indirect fire, augmenting the fire power of infantry weapons and artillery.

(c) Flame throwing tanks and bulldozer tanks were invaluable and additional tanks of these types should be included in the organization of a tank battalion.

(d) For detailed operations of the 4th Tank Battalion, see Annex Jig, 4th Tank Battalion Report.

6. ROCKETS

(a) Again the massed fire power of the 4.5 barrage rocket exerted a marked influence on the successful outcome of the IWO JIMA operation. This short-range weapon was repeatedly used by the infantry to neutralize centers of resistance and to thicken preparatory fires prior to an attack.

(b) Training of the 1st Provisional Rocket Detachment prior to the operation was seriously handicapped by the late receipt of ammunition and material and by the transfer of one-half of experienced personnel of the detachment to the 5th Marine Division late in the training period. Intensive rocket training was conducted for approximately one month prior to embarkation for IWO JIMA.

(c) The first section was attached to RCT 25 and the second section to RCT 23 for the operation. The Provisional Rocket Detachment headquarters was assigned to the support group. The sections landed generally as planned, although, in view of the congested beach conditions and the lack of access roads inland, it is considered that they were landed too early. Because of these

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conditions the first use of rockets did not occur until D plus 3.

(d) The rocket trucks drew enemy mortar, rocket, or artillery fire practically every time a rocket was fired, and many times while the trucks were being moved into position. Therefore, it was important that the vehicles maneuver rapidly into a position, fire the barrage, and move back to a rear area assembly point. When an intensive barrage was desired in a certain area, a section, consisting of six trucks, would fire one barrage, reload from ammunition carried in the trucks, and fire again. This double barrage took less than five minutes and consisted of 432 rounds.

(e) Much greater and closer support was fired by the rocket detachment on this operation than on the Saipan or Tinian operation. The sections were used frequently to fire preparatory barrages prior to an attack, then increase the range and fire barrages in support of the attack as the troops advanced. As a safety factor rocket barrages were normally fired at least 300 yards forward of the front lines. However, on this operation the infantry demanded closer support during critical stages and it is estimated that 12 to 15 barrages were fired less than 200 yards forward of the front lines.

(f) Effective conduct of fire was greatly impaired by the lack of a forward observer team with each section and by the inadequacy of communications. It was frequently necessary for infantry company commanders or personnel at Battalion OP's to adjust fire into the desired target area since the section leader, the only officer in the section, was required at the firing section position. As on Saipan and Tinian, it was found that a forward observer section of one officer and four enlisted for each firing section is absolutely essential for efficient conduct of fire.

(g) While the 4.5 barrage rocket has been used successfully by the Division in the past three operations, it is considered that the 5" spin stabilized rocket should be substituted therefor in order to obtain more flexibility in range, greater fire power, and considerably more accuracy.

7. WAR DOGS.

(a) The 7th Marine War Dog Platoon, consisting of three sections, was attached to the Division for the operation. In the task organization one section was attached to each RCT. The first section was landed by RCT 25 on D-day, while the second and third sections, attached to RCT 23 and RCT 24 respectively, were landed on D plus 2 day.

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(b) Throughout the operation the dogs were used primarily for security at night in the front lines, rear area security, and in mopping-up operations. The value of the dogs in front line security was attested to by the fact that on frequent occasions they alerted at approaching enemy infiltration parties, and gave front line troops an added sense of security due to their presence. Failure of the majority of the dogs to enter caves limited their value during mopping-up operations. On patrol the failure of the dogs to distinguish between hidden Japanese riflemen and Japanese dead limited their usefulness in this type of operation. Messenger dogs, when used, carried out their assignments in a highly satisfactory manner.

8. CHEMICAL

(a) Personnel of the Division were equipped and fully indoctrinated in the use of all individual chemical protective equipment authorized in the Table of Basic Allowances, as well as in field identification of toxic agents, and first aid. Battalion decontamination squads were trained in the technique and procedure of decontamination. Chemical warfare officers and key non-commissioned officers were thoroughly conversant with the Division Chemical Warfare Standing Operating Procedure, and were prepared to carry out the procedure set forth therein had chemical warfare been initiated.

(b) Chemical warfare equipment was held loaded on ships in such a way as to render it immediately available for emergency use.

(c) Gas masks were carried ashore by all personnel. Some unit commanders had the gas masks turned in to easily accessible dumps when it was definitely ascertained that there were no enemy chemical agents on the island. This procedure, however, was only localized.

(d) Chemical warfare supplies and decontamination equipment were deposited in regimental dumps as soon as possible after they were landed.

(e) The enemy did not use toxic agents against our troops at any time. No previously unreported enemy materiel was captured. Enemy troops were equipped with gas masks, inferior to ours, which they carried with them at all times. Both the Division and enemy troops were prepared had chemical warfare been initiated.

(f) Gas masks collected during the operation were turned in to the Division salvage dump. 5,988 gas masks were turned in

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for salvage. Of that number, 2,140 were serviceable and 3,848 were unserviceable. Those which were unserviceable were turned over to the Island Command, this Division having no facilities for repairing gas masks. 420 gas masks were re-issued from salvage during the operation.

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