SOVIET NAVAL AVIATION: CONTINUITY AND CHANGE

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INTRODUCTION

The effectiveness of the Soviet naval air arm can best be judged by the quality of the training of its pilots and cadre. To many analysts in the West, especially those who are more interested in threat assessment, this would appear a rather mundane venture. However, few aspects of Soviet naval development are more pertinent to the West today than the education of their aviators. Inferences concerning Soviet naval aviators' capabilities can be made by examining the positive and negative aspects of their training. Though there have been a number of articles dealing with the training of Soviet naval aviators, few, if any, have been primarily concerned with the pedological instruction and retraining of land-based and deck pilots. The scope of this study is directed to further understanding the course of their professional development.

A key aspect of this inquiry is to evaluate the psychological problems that the Soviets identify and the corresponding remedies employed to correct them. Soviet naval authorities believe that stress and tension are the most common contributors to mission failures. The desired course of action is best described by Nathan Leites. He notes in his work, The Soviet Style in War, "The objective is to be calm (the more critical the moment, the calmer), hence capable of concentrating on the task at hand, hence performing it well."[1] As a consequence physical training, especially at the time of admittance to a flying school, is of prime importance in the overall instruction of the novice. Soviet medical specialists feel that a well-conditioned aviator is less inclined to tension and more capable of correct decisions in unexpected situations than one who is less fit. In examining the procedures adopted by Soviet naval psychologists and

physiologists, it can be assumed that the Soviets are utilizing sports medicine techniques to correct pilot deficiencies and to improve instructional methodology.

Most of the material used in the project are from Soviet open source literature, such as Morskoi sbornik, Voenno-istorichskii Zhunal, Chelovek Okean Voina, as well as other materials in Russian or translation. The scope of the work is to deal with the training of naval aviators on flying status. Limiting the realm of this study necessitated in the author's omission of onboard physical and personal combat training and the work of deck aviation flight crews during preflight preparations. Most of the material in this area, especially Chelovek Okean Voina (Man and Sea Warfare) indicates that naval aviators follow the same training procedures as sailors in nuclear, chemical, and biological exercises. Andrew Cockburn in The Threat: Inside the Soviet Military Machine and Milan Vego's recent article "Warsaw Pact Naval Training," which appeared in October, 1981, in Navy International address this problem. Both writers feel that the training of Soviet seamen is below par and results from the rigid character of naval pedagogy. This is still maintained despite the fact that the Soviet navy receives a higher than usual number of better educated recruits and keeps them in the navy over a longer period of time. Even then, Cockburn feels, "tasks requiring anything more than the simplest level of expertise still have to be done by officers."[2] After close examination, Vego concurs that "combat training is characterised by a very strong emphasis on setting quantitative instead of qualitative goals." As a consequence, he found, "The drills and exercises are seemingly conducted in a routine, mechanical manner and thus lack realism and constructive value."[3]

The ramifications of those statements are plainly evident in the maintenance problems of an assortment of helicopters and VTOL aircraft. In an unsigned article in Morskoi sbornik entitled "Adres aerodroma-okean," one is clearly able to visualize its relevance. A pilot recalls a conversation with a mechanic, Alexandr Kugumov, when he discovered that the mechanic was not tightening the bolts of a control monitor tight enough. The pilot concluded, "One can be unwarrantly sharp, but I said that carelessness in our work is inadmissible and it can cost a person his life. After that incident the detail was never repeated." As a result, technicians and pilots are encouraged to work together during long voyages as a means of further checking the craft to limit the mechanic's negligence. Although this is standard operating procedure for all Soviet flight personnel, and may not be reflective of inadequate maintenance practices, it does indicate a Soviet concern with the performance of their enlisted technicians. Oppokov warns, "Every oversight can be cause for mishaps." How many accidents are attributed to pilot error, but are the direct consequence of faulty training of ground support personnel? Only the Soviets know for sure, and even then that may not be the case. It is evident that the Soviets have paid a heavy price in men and material for a rigid training philosophy, and will pay even more if naval aviators have to carry out wartime missions.[4]

Before probing the subjects of training, education, and psychological attributes of Naval pilots, it is pertinent to examine the historical evolution of the role and mission of SNA. By doing so, we may be able to ascertain where they go from here?

NOTES

[1]Nathan Leites, The Soviet Style in War (New York: Crane Russak, 1982), p. xxiv.

[2]Andrew Cockburn, The Threat: Inside the Soviet Military Machine (New York: Random House, 1983), pp. 266-267.

[3]Milan Vego, "Warsaw Pact Naval Training," Navy International, October, 1981, p. 599.

[4]V. Oppokov, "Vzlet sredi voln," Morskoi sbornik, No. 1, January, 1983. p. 61; "Adres aerodroma-okean," Morskoi sbornik, No. 1, January, 1983, p. 54.

CHAPTER ONE

THE DEVELOPMENT OF SOVIET NAVAL AVIATION

For the last fifteen years American and NATO defense analysts have been concerned with the growth of Soviet naval power. At first, in the late 1960's and early 1970's, Robert Herrick and Seigfried Breyer, leading authorities in the field, concluded that without aircraft carriers, Soviet Naval aviation (SNA) is principally defensive. Breyer is quite explicit and asserted, "The fact that the Soviet Navy has no aircraft carriers limits the maritime capability of the Soviet Naval Air Forces." Herrick in 1968 even went further:

> Until the Soviet Navy builds strong attack carrier striking forces or unless some presently unforeseeable technological breakthrough really does make them too vulnerable for use in both general and limited war, Soviet naval practice will, of necessity, remain strategically defensive.

Those views have been substantially altered in the intervening years, especially in light of intelligence reports of the possible construction of a 60,000 ton carrier. Writing in 1981, Jan Breemer viewed the construction of this ship as an extension of general Soviet naval doctrine -- protection of their submarine ballistic forces, the destruction of the enemy's naval assets, interdiction of his supply lanes, and support of Soviet land forces.[1]

Earlier many experts questioned the combat worth of Soviet Naval Air assets since they are primarily land based. However, there are those conservative analysts who either distort "the Soviet threat" or who are so ignorant of Soviet naval intentions that they manufacture an inaccurate assessment of Soviet naval abilities. An excellent example of this is the recently published work by Edward N. Luttwak, The Grand Strategy of the

Soviet Union. In the brief section he reserves for the Soviet Navy, he notes that the Soviets can only fight in conditions where they are able to receive air support from land-based naval air units, including the Backfire bomber in a strategic role. His analysis is only partially correct and follows the standard view maintained by many naval experts, but his assumption is untrue concerning the Backfire. Although the Backfire has strategic capabilities, it is now assumed that its mission is anti-ship/anti-port. What is particularly interesting is that he makes no mention of Soviet naval air platforms as a vehicle for Soviet expansionism.[2]

There are also those responsible individuals who fall under the spell of ethnocentric bias. According to Ken Booth, "Threat assessment is not concerned just with 'capabilities and intentions,' but also with ways in which capabilities and intentions are perceived and misperceived."[3] Andrew Cockburn, a noted English journalist, is an excellent example of this problem. In his recent and popular study of the Soviet armed forces, The Threat: Inside the Soviet Military Machine, he is concerned with waste, corruption, incompetency, and faulty technology in the Soviet Union. However, in analyzing the Yak-36 Forger, he failed to note its mission and purpose within the confines of Soviet naval doctrine. What he did was to interview naval pilots at the U.S. Navy's Fighter Weapons School at Miramar. He describes aviators when assessing the possible threat of the Forger; "The response was a burst of derisive laughter. Since these particular men were tactics instructors, extensively drilled in Soviet air capabilites, their assessment of the Forger, with its 16 minute flight limit, speaks for itself."[4] But did those men understand the Forger's mission?

In another vein some analysts assume that if the Soviets do not have carriers like the United States, then they do not have a naval air force

worthy of the title. Those views are maintained by experts and laymen alike, despite the evidence to the contrary which indicates that the Soviets have constructed the second largest naval air force in the world. In the period between 1983-84 it consisted of 59,000 men, 755 combat aircraft, and 300 helicopters.[5] Such a force represents a viable threat to western surface vessels and, with the addition of a CTOL attack carrier, a possible vehicle for Soviet power projection. Even without shipboard air assets the Soviets have the capability to force the NATO powers to pay a heavy price in men and equipment to maintain control over the U.K.-Iceland-Greenland gap to close that "choke point" to Soviet submarines. The eventual evolution to carrier air forces was the urgent necessity to protect the homeland from the dangers of American SSBNS. The threat from that direction is considerable and has resulted in the expanded mission of Soviet naval aviation.

This study, as a result, is designed to familiarize the reader with those components of Soviet naval air which deserve closer scrutiny. These include training, flight psychology/physiology, and related personal problems as identified in Soviet open source literature. In examining the combat ability and readiness of the SNA it is important to make a logical assessment of the combat worth of their naval air force. Milvan Vego, while studying shipboard training patterns, concludes:

> The Soviet naval training is conducted at a very high level of intensity. Yet the Navy hardly seems to achieve the degree of excellence and effectiveness so unduly advertised. Training objectives are generally set too high. Thus, the results are not at all proportionate to the extraordinarily large effort involved.

He further asserts that those defects are particularly apparent in "technical and specialized training." The consequence of this is a corresponding

reduction in combat readiness, since naval personnel perform so poorly in regards to weapons and equipment training. Likewise political activities are most successful since they are used to control and discipline. This concept is highlighted in aviation by the creation of Bch-6 as an integral department/action station for aviation since 1978.[6]

A review, first, of the historical developments of Soviet naval aviation is in order. By examining the changes through the Great Patriotic War, it will permit the reader to grasp the current trends and expanded mission of one of the most important elements of the Soviet navy today; naval aviation.

In the period before World War I, the Tsarist government made its initial investment in naval aviation. This resulted from the naval ministry's interest, since the 1980's, in lighter-than-air-craft. Eventually, the navy purchased eight dirigibles whose mission and assigned duties included support of mine-laying operations. However, the attempts to establish a viable naval air force were severely limited by the weakened state of the technostructure of Imperial Russia. Kendall E. Bailes notes that the aviation field received marginal assistance from the government before the Russo-Japanese War. Most help came from the Russian technological Society (RTO), first established in 1866 to foster the growth of science, technology and industry. He feels that the neglect demonstrated by the Tsarist regime was not unique to Europe at the time and concludes:

> Russian technologists felt that, given the weakness of private industry, Russian political leaders were even more backward. And, of course, if there was neglect in the military sector of technology, there was an even greater vacuum of support in civilian areas. Creative specialists interested in innovation, therefore, felt very much on their own in this period.[7]

Despite these shortcomings, a special school was created at Sevastopol for the training of crews and the facilities for the repair and housing of the craft. The Duma budget of 1913 allocated funds to the navy for a program to provide and maintain 330 planes, ninety of which were built by Sikorsky, and included ten of his four-engine giant, the Ilia Muroments. Those aircraft later were designed to carry a load of either 16 passengers or half-a-ton of ordnance. He built them in both a sea and land plane version and during the World War they experienced modest successes with only three being lost to enemy fire.[8]

At the outbreak of the war, the organizational structure of naval aviation consisted of one aviation division for both the Baltic and Black Sea Fleets. An air division was subdivided into two air brigades, which was somewhat comparable to a western squadron. Overall, 100 planes were assigned to each fleet, including the aircraft attached to the Orlitsa, Alexandr I, and Nicholai I. A few, perhaps 15 to 20, dirigibles were still assigned to the navy at that time. With Russia's entry into the war, all phases of aviation were found to be unprepared for naval operations. For example, hangars and other service facilities were in short supply and the navy was dependent upon foreign sources for engines and aircraft, especially hydroplanes designed by Curtiss.[9]

During the war, the Tsarist Naval High Command made considerable innovations in air strategy. This was evident in developing seaplane tenders which altered standard naval aviation concepts. In 1915, the navy successfully converted the 5,000 ton liner Imperatritsa Aleksandra to a tender. It was originally designated a as training vessel to disguise its mission. The newly redesigned vessel carried eight seaplanes and was equipped with a hangar located on deck. After completion it was assigned

to the Baltic fleet.[10] Later, two 9,000 ton warships were constructed and classified as hydro-cruisers which carried seven or eight seaplanes and included such on-board armaments as six 120 mm and four 75 mm guns. In 1916 other heavily armed naval cruisers were ordered to support them in order to create, as one writer termed, "a primitive battleship-carrier task force." Later, the Soviet navy returned to study the actions of hydro-cruisers and surface ship formations as early as 1927, when N. Novikov wrote a staff study entitled, Operatsii Flota Protiv Berega na Chernom More v 1914-1917 godakh. The work went through three editions, with the third being published in 1937. An explanation might be the growing threat by the Japanese in the 1930's to the Soviet Far East, the only likely opponent with a substantial naval air arm that could challenge the Soviet navy in that area.[11]

At the outbreak of the Revolution, naval aviation was seriously divided between officers and enlisted men. One point, which dramatized the gulf between the ranks, occurred when officers in 1917 proposed to attack the Smolny Institute, the Bolshevik headquarters. With the actual seizure of power, many aviators openly sided with the Whites; those who did not were sent to the Don Front to stem the Cossacks, who then threatened Bolshevik authority.[12]

All air assets were organized, including land, naval, and lighter-than-air, into the air fleet (Vozdushyi flot) command by the order of 25 January 1918. The standard tactical formations employed by land based air units during the Civil War were separate aviation detachments, subdivided into three flights of two planes each. In such an arrangement, fighter and reconnaissance detachments were created. However, fighter detachments were usually merged to form fighter divisions, which included by 1920 twelve

detachments of 72 planes and 41 reconnaissance detachments of 246 planes. An Ilia Muroments air group at the conclusion of the Civil War was composed of three detachments of two planes each. But during the struggle with the Whites, the Soviets, as recent literature acknowledges, were plagued by a poor industrial base, principally in the area of aviation. Despite these problems, Soviet repair facilities were able to return to service roughly 1574 planes and 1740 engines.[13]

Resupply was a problem which was overcome by the capture of White Guard equipment and the mobilization of the aviation industry. With the liberation of Archangel, for instance, the Soviets were able to acquire 139 Sopwitchs, 44 Newports, 31 Farmonts and approximately 300 engines. Captures such as these resulted in an accelerated growth of the Soviet Air fleet by 50 percent. Despite the earlier problems, industry likewise made a contribution by producing 650 planes and 270 motors during the Civil War period. But the total level of aircraft on all fronts during the Civil War remained somewhere around 300-350 aircraft.[14]

Naval aviation in the Civil War could not have been more than 100 planes. At the end of 1920, it was composed of four hydroaviation divisions, ten hydroaviation and four fighter detachments. Naval aviation also maintained 25 lighter-than-air detachments which included one anchored balloon and a winch. These units, principally the hydroaviation detachments, were used in the South, on the Volga, as well as on Lake Onega and the North Dvina. In spite of this motley force, naval air assets made a valid contribution to the war effort and assisted in the recapture of Kazan in September, 1918. Naval air provided the only effective air cover the Red forces could depend upon during the battle. Eventually those same

formations were instrumental in the destruction of Kolchak's White Guard units on the Volga and Kama.[15]

Between 1920 and 1935 the SNA on the Baltic and Black Seas fell under the control of the Red Air Fleet. These units were subordinate to the chief of the VVS (air force, Voenno-Vozdushye Sily). The naval air commanders maintained operational control, despite the dual responsibilities that they shared with the Army air force commanders.[16] During World War II this ultimately bode ill for an effective air defense of naval bases and surface ships.

During the 1920's the training of naval aviators was of grave concern to the authorities. The training facilities at Nizhni-Novgorod moved to Yeisk near the Sea of Azov. At first, training centered upon floatplanes and seaplanes, whose mission was to protect the fleet, but in the 1930's the emphasis shifted to land based aircraft, which demonstrated the advances in technology that made land based aircraft much more appealing than hydroaircraft. The entrance requirements, by today's standards, were quite low, since numerous applicants had little or no formal education. The Army course was for eighteen months, but the naval training period was somewhat longer. It consisted of a practical program of naval aviation, aviation fundamentals, and advanced navigation. Following graduation, the best and the brightest students were assigned to further accelerated training with German instructors at Borisoglebsk.[17]

Another pressing problem confronting both Naval and Army aviation was design and procurement. By this time, the air forces were in great need of new aircraft, since the units still in service were obsolete and in a state of serious disrepair. In 1925, P. I. Baranov, chief of the VVS, proposed the creation of an agency, the Central Design Bureau, to work on land and

seaplane design. D. P. Grigorovich, a noted designer for the Imperial Navy, who was responsible for the M-5 and M-9 seaplane types, was assigned to develop replacements for those ealier models.[18]

Grigorovich, who employed forty designers, experienced countless failures over a two year period. For example, the NR-2, a reconnaissance seaplane, crashed in 1926. The NUR-1, MUR-2, ROM-1, and ROM-2 all met similar fates during flight tests. As a consequence, the Soviets were forced to purchase foreign built seaplanes from Germany and Italy well into the 1930's. Because of the failures of their own designers, the Russians turned to foreigners to fill the void. One such aircraft designer was Paul Aime Richard, a Frenchman, whose assistant was Sergei Korsylov, a pioneer in the Soviet space program. Richard was entrusted with the TOM-1 torpedo bomber, and when this program failed, the design bureau was disbanded.[19]

A. N. Tupolev was given the responsibility of designing a long range flying boat. This was to be accomplished from modifications of earlier models, the ANT-8 (MDR-2), and was completed in 1931. The Navy turned it down since its landing and take-off speeds excelled navy requirements, and by then, the navy had already considered the craft obsolete. Tupolev directed his attentions to developing a massive six-engine bomber, which eventually replaced the army's TB-3 heavy bomber.[20]

On the eve of the first Five Year Plan (1928-1932), SNA roughly comprised 94 aircraft and approximately 1,900 men.[21] Admiral Gorshkov traces the development of Soviet naval policy in the post Civil War period in Morskaia Moshch gosudarstva. In his analysis the principal threat still remained the Western imperialists and "did not stop active preparations for an armed attack on the young Soviet Republic." As a consequence much time and effort were spent on the restoration of the army and the navy. Because

of the limited number of available warships, naval planning revolved around the necessity of developing a strategy of coastal defense. This view resulted in the "theory of a small war," and Gorshkov feels that its origins emanated "from specific conditions, which determined the rational means and forms of the struggle of the fleet with a greater naval enemy." The strategy reflected the ability of the Soviet navy to defend the country from "the next aggressor and the economic capabilities of the Soviet government." In May, 1928, the Revvoensovet redefined the role of the navy in the overall structure of the armed forces. This included the establishment of shore-based naval aviation to assist in the coastal defense of the State.[22] It should be noted that this corresponds to the first Five Year Plan, the development of a Soviet military industrial complex, and advances in aviation technology.

This attitude changed with the rise of a belligerent, resurgent Germany and the threat of Japanese expansion in the 1930's. So did the struggle between the factions within the navy hierarchy -- those who favored the coastal defense strategy and those who advocated an oceanic approach. The position of the oceanic navy was maintained by the navalists in the Far East. The establishment of a naval force in this region had its origins in 1932 following the Japanese invasion of Manchuria, and in 1935 it was renamed the Pacific Fleet. It consisted of light surface vessels and aviation units originally designed for coastal defence.[23] Thus, there exists a correlation between a specific threat and the expanded mission of the navy with the development of the Pacific Fleet and a concern with an oceanic concept including carriers.

With the general decay in the international situation in the 1930's especially during the Spanish Civil War, a shake-up was in the making in

the military hierarchy. However, it was impossible to gauge the severity and totality of the changes caused by the eventual purges, which contributed in the navy to a revolving door in the Naval High Command. For example, between 1937-1939, there were five command changes with all four commanders (Orlov, Viktorov, Frincevsky and one old Bolshevik, R. A. Muklevich) being swiftly imprisoned and executed. The details of the Muklevich case were pivotal since his execution on February 7, 1937, marked the attack on the navy. Robert Conquest, in his thorough study of the purge era, relates that assailing the navy required explicit charges. But when I. F. Tevosyon, People's Commissar for Shipbuilding, accused Admiral Muklevich of blocking the building of a powerful navy, it sealed his fate. But, Conquest notes, "It was less a matter of settling technical disputes by executions than of using technical disputes as one excuse for executions." Adam Ulam assumes, "Stalin had great ambitions for the Soviet navy; he wanted Russia, for the first time in history, to take its place among the world's great powers. He had little patience with the argument that the day of great surface vessels was over -- he liked big things." He also estimated that in the 1930's "the navy's personnel was being cut down more pitilessly than the Army's."[24]

During the purge years, the Commissariat of Naval Affairs was separate from the Commissariat of Defense. The impact on naval air formations was more pronounced because on January 1, 1938, Naval Aviation was removed from the VVS and returned to the VMF. Kir'ian asserts, "From that time its condition as one of the branches of the forces of the Navy took shape."[25] As a consequence of this move, the VMF was able to develop its own logistic and educational systems.[26] Also by the separation, naval aviation was expanded to over 1,000 aircraft, and plans for an aircraft carrier were

built into the construction schedule, though actual work was not to begin until 1942.[27]

In the 1930's, the Soviets concluded that the next war would involve the operations of large formations of mechanized infantry and armor units requiring considerable air support. In a continental and operational setting Soviet military experts felt that this challenge was the most threatening, and their response contributed to the birth of the concept of the operation in depth. In such a scenario, naval elements would play minor roles with aviation assigned a crucial mission in support of the ground assets. But the navy, on the other hand, because of the cost of large capital ships, would rely upon submarines, MTBs, coastal artillery, and aviation to "conduct independent actions at sea." The VMF would carry out air strikes and torpedo attacks against enemy fleet, naval installations, and sea communications. The means to implement those assignments was to act either independently or jointly in combined arms operations.[28]

The question of aircraft carriers will be discussed further in the chapter, but the Soviets during the 1930's attempted to obtain from the United States plans for a battleship and an aircraft carrier. The U.S. Navy rejected this proposal, and according the Robert Herrick, the Soviets attempted, following this failure, to build their own. In Herrick's account, this was done with Stalin's blessing. Earlier, rumors reached the West that a 1914 cruiser hull in 1929 was being converted into a 25 plane carrier called the Stalin. The information proved to be erroneous, as well as later rumors that the Soviets were building two 12,000 ton carriers, the Vorshilov and the Krasnye Znamia in 1939-1940.

Herrick's interpretation of the necessity for the Soviets to build aircraft carriers, as war with Germany approached, had led to a lively

debate. This view is challenged by Jacob Kipp and Michael MccGwire. Herrick's critics feel that with the likelihood of war, it was foolhardy for the Soviets to invest precious resources in building carriers when the war must be won on the continent and by contesting the Germans for control of adjunct coastal regions. Even by planning a carrier, it eventually diverted material which was needed for the building of sophisticated aircraft to compete with the German for mastery of the air and the needed ordnance to fulfill that mission. Professor Kipp notes, quite justifiably, "to construct carriers, when fleet operations would have been hampered by hostile geographic circumstances, would have been criminal."[29] In examining the various arguments, it is clearly evident that it would have been impractical for the Soviets to make such a massive investment in carrier construction when they would have been so vulnerable in the Baltic from land based German air assets. A similar argument can be made concerning carriers in the Black Sea where the threat did not warrant such huge capital ships and would only further exhaust precious military stores.[30]

Prior to the Great Patriotic War Soviet naval aviators were given the opportunity to demonstrate their skills during the Winter War with Finland in 1940. The results proved far from heartening. Coordination between the air force and the navy was poor, and torpedo attacks needed considerable refinement. In fairness, the weather conditions during the fighting possibly contributed to their dismal performance. Even though the SNA was increased by 29 percent, most of its equipment was dated which made it difficult to carry out combat missions. Because of their limitations -- speed and load capability -- they were seldom able to operate beyond the range of their bases. Modern aircraft, which was to be assigned to the navy, was still on the drawing board and in the R and D phase.[31]

In the immediate pre-war years the Soviets realized their limitations. They, like the other powers of the period, thought in terms of an oceanic navy. The reason, according to Kir'ian, was that large surface assets were "considered the main and most universal forces -- the core of the Navy." Submarines were viewed as a means of attacking and severing the enemy's communications. However, when the war began, Kir'ian notes that it "created a basis for considering aviation as the main strike force in combat actions against surface warships, naval bases, and transports." This view reinforces the interpretation that the Soviets did appreciate the role of aviation, principally land based, and did not need aircraft carriers to support fleet operations or for coastal defense.[32]

When the German army invaded the Soviet Union on June 22, 1941, Soviet naval aviation was increased by 10 percent above the 1940 level. Naval air formations were supplied with the standard weaponry then available to the Red Air Forces. Such aircraft were principally designed for land operations and had marginal utility for war at sea.[33] There were, however, more than 2,500 planes in their inventory at war's outset.[34] Despite those impressive numbers, roughly 87.5 percent were considered already obsolete.[35] Even at that time some modern aircraft were making their way to naval aerodromes. The modern Pe-2s and Il-4s would arrive later.

Also in the prewar period, the Navy issued directives in 1937 and 1940 which had significant ramifications in the development of the naval air during the war. These were the implementation of joint arms operations between the army and the navy. The idea first originated in the 1930's. According to the tactical plan, the navy was assigned the responsibility to defend coastal areas jointly with the army and to operate independently at sea.[36] Admiral Gorshkov, in his article in Voenno-istoricheskii Zhurnal,

"Razvitie voenno-morskogo iskusstva," was mistaken in claiming that such operations played a pivotal role in the defeat of Germany by interdicting the enemy's sea lines of communications with the coordination between submarines, surface vessels, and aircraft. As Kir'ian has related, the concepts of naval combined arms operations came somewhat later.[37]

From the beginning the mission of Soviet naval aviation was to defend naval bases and surface units as well as to perform air reconnaissance. Those missions were to include minelaying and interdiction, but with the serious reverses of Soviet arms in the first phases of the war, SNA was used to support the Red Army. Kilmarx claims, in reviewing the record, that the achievements of naval aviators throughout the course of the war exceeded that of the Red Air Force. Superior training, he feels probably accounts for some of their successes.[38]

During the early stages of hostilities the weaknesses within SNA were apparent. This was particularly evident in the failure to devise a reliable operational plan to protect both their naval bases and ships at sea.[39] The enemy's achievement of strategic surprise further enhanced this problem. The result was the swift capture of Soviet Baltic naval bases and air fields and drastically limited fleet operations. But during this period, naval aviators conducted the first bombing mission over Berlin in August, 1941.[40]

The Soviet air strike on Berlin is a classic example of Russian daring. The idea originated following German air raids on Moscow and other Soviet cities. Berlin was a logical choice for a retaliatory raid since it was not only the capital but also the center of the German munitions industry. However, the air staff also studied the likelihood of Stettin, Konigsberg and Danzig being designated as the objective if Berlin was ruled

out. Ultimately, in deciding to attack Berlin, the Soviets had to take into account the considerable anti-aircraft defenses -- including night fighters, interceptors, and AA artillery. Lt. General Petr Khukhlov recalls, "We understood everything well, that to approach Berlin in our relatively slow Il-4 in daylight hours was completely impossible." As a result the raid occurred at night and that "it was literally necessary to calculate it by minutes." After all the preparations were made, the 1st Mine-Torpedo Aviation Regiment was ready for the attack.[41] The Germans credited the raid to the British, which only brought smiles to the Russian participants.[42]

Another fundamental problem created by the German attack was the loss of shipyards which had the impact of limiting the navy's role in the strategic sector, but despite those limitations the navy performed creditably in all phases of the struggle. One of the first principal actions taken by the State Defense Committee of July, 1941 was to halt the further construction of major surface vessels and the emphasis was then placed upon light combat units. In spite of the handicaps imposed by the war, the navy was supplied new vessels; for example, in the second phase of the conflict the Baltic Fleet acquired roughly 300 warships and auxiliaries. The navy's air assets were substantially increased. From the spring of 1942 to 1943 SNA grew to 1430 aircraft. At the same time, naval aviation experienced a reorganization phase which contributed to its heightened state of combat efficiency. In the beginning, SNA was delineated into mixed brigades. These units were reorganized by mid-war and were replaced with mission specific units -- fighter, attack, and bomber units -- which closely paralleled Frontal Aviation.[43]

As the struggle progressed and the fortunes of war changed, the power of Soviet naval aviation manifested itself. During the siege of Leningrad, the role of naval aviation was pivotal in the city's defense.[44] However, the most effective use of naval air power during this time was in the Black Sea. There, the naval air units demonstrated their ability in combined arms operations in support of amphibious assaults and the interdiction of German resupply and evacuation operations. The latter mission was accomplished without the benefit of surface counters in a supporting role.[45] German observers noted as early as January 22, 1943, "The vigorous employment of the Soviet Air Force, and particularly of aerial torpedoes, represents a substantial threat to the still inadequately protected convoys."[46] The Germans clearly understood the threat that naval aviation posed during their evacuation of Sevastopol in 1944.

In the Arctic, the Northern Fleet, the youngest of the Soviet fleets, and the last to receive modern aircraft, fell drastically short in aiding Allied convoys sailing to Murmansk from U-boat attack. Despite those shortcomings they carried out a number of joint arms operations. A classic example occurred on September 24, 1944. The action began when the Soviet submarine, S-56, while on patrol off the North Cape detected a German convoy and sank one transport. When the report of the S-56 reached the Northern Fleet command center, it was decided to conduct a joint arms operation against the convoy. Included in the planned attack were MTBs and fifty-two aircraft. Air reconnaissance was conducted and was responsible for determining the German order of battle and noticing any changes in it before the attack. The initial air assault was conducted by eighteen sturmoviks and fourteen fighters. Eighteen additional fighters were

assigned to provide top cover. The air strike was supposed to occur simultaneously with the MTB attack, but the aircraft arrived late and the MTB brigade commander made the decision to proceed. When the planes eventually arrived, the results were devastating. The Soviets sank one transport, two others were beached, and additional transports were so severely damaged that they had to be towed into port.[47]

In the Baltic after the Finnish capitulation, the Soviets had a splendid opportunity of interdicting German attempts to evacuate and resupply the besieged garrison in Courland. However, they were not as successful as they had been in the Black Sea. During the remaining year of hostilities in the Baltic, naval aviators attacked enemy surface units and laid mines along the East German coast and rivers in support of shore operations.

In reviewing the qualities exhibited by Soviet naval aviators it appears that their most remarkable quality was their stubbornness when attacking small naval vessels. The Germans felt, in retrospect, that Soviet naval aviators, despite their continual improvement in training and tactics, were not as proficient as their Anglo-American counterparts.[48]

With the conclusion of the war in Europe, the Soviets obtained the partially constructed and severely damaged German aircraft carrier, Graff Zepplin. But the vessel sank in the Baltic while transporting war booty to the USSR. Until the commissioning of the anti-submarine cruiser Moskva, this was as near as the Soviets came to including an aircraft carrier in their inventory during the postwar period. However, there was yet one more mission for the SNA to perform before the conclusion of World War II.

In the war with Japan, the naval air forces were divided between the air assets of the Pacific Fleet and the Northern Pacific Flotilla. Combined, they were able to throw 1790 aircraft against the Japanese. Of

those, 1495 were warplanes and were composed of 665 interceptors, 243 sturmoviks, 164 bomers, 157 torpedo bombers, and 266 reconnaissance aircraft. If the air elements of the 9th, 10th, and 12th air armies are included, the actual number of aircraft totaled 5706. The SNA at the time of hostilities was equipped with the newest available aircraft either built in the Soviet Union or provided under lend-lease -- Yak-9s, Yak-76s, La-7s, Tu-2s, Pe-2s, Il-4s, Aircobras, Bostons, and Catalinas.[49]

Over 60 percent of the pilots, who were involved in the war with Japan, had acquired previous combat experience against Germany. This probably accounts for their aggressiveness during the brief period of hostilities with Japan. The area and the mission assigned to SNA, as well as surface formations, was along the east coast of Korea and the area adjacent to Sakhalin and the Kuril Islands. They were to attack and destroy enemy shipping that they found at sea and in port.[50] The record of the SNA in the brief war with Japan was quite impressive. For example, naval aviators logged 4,724 missions with a flight time of 11,095 hours. They destroyed 15 warships and transports of roughly 78,430 tons as well as countless trains and artillery batteries. The Naval air forces enjoyed such air superiority that they only encountered four dog fights which culminated in three Soviet victories.[51]

In reviewing the achievements of naval aviation during the course of the war, P. N. Ivanov notes in Kryl'ia Nad Morem:

> In the Great Patriotic War aviation of the navy was the most active type of naval forces. It sunk 67% of war and auxiliary ships and approximately 57% of the enemy's transports from the number having been sunk by all forces of the operational fleets for the war years.

Also he justly believes, "The results of naval aviation's military actions, with all the evidence, demonstrated the bankruptcy which occurred in certain circles in the prewar period opinions purportedly about it as an auxiliary in the struggle at sea."[52] Even Admiral Kuznetsov, and other Soviet Admirals, realized the lessons of the past war, especially for air power and its impact on naval doctrine. It was evident to Kuznetsov, and S. Gorshkov, his successor, that the most effective naval forces were shore based aviation and submarines.[53]

In the postwar period, Stalin planned, once the economy was restored, to build a balanced fleet, which would include incorporating carriers into the navy. Over 150 Mig-15s were built with arresting gear for possibly that purpose.[54] Of course, no carrier entered service following Stalin's death in 1953. And it was even more apparent to many within the naval hierarchy that a continued reliance on shore-based aviation to defend the homeland would deny the navy its goal of an "active defense." This argument continued in navy circles while the navy became "the handmaiden of the Army."[55] However, the mid-1950's, according to Kir'ian, "became a turning point for the Soviet Navy." It was during this time particularly that advanced technological changes altered naval strategy with the advent of nuclear weapons.[56] This was a principal variation from the immediate postwar period, when the navy was still coastal in orientation.[57]

The Soviets consider the 1950's as the beginning of the scientific technological revolution. As a consequence, the Plenum of the Central Committee of the Communist Party outlined a concise plan of development. V. D. Sokolovskii's publication of three editions of Voiennaia Strategiia in the 1960's is a reflection of this move. It should be further noted the emphasis placed here upon the use of nuclear weapons in future wars.

This shift had significant ramifications for the development of the navy. Kir'ian asserts that because of the American emphasis on nuclear propulsion in both submarines and surface ships, the Soviets responded with an "oceanic rocket-nuclear navy," especially in the area of submarines.[58]

In the Khrushchev era the aircraft carrier lost its appeal to the Soviet Union, even though U.S attack carriers emerged as a major delivery system for U.S. nuclear weapons against the Soviet heartland. Khrushchev believed that with the advances in the scientific-military-technological revolution aircraft carriers were as obsolete as battleships. This interpretation contributed to a reorientation of naval aviation into a long range shorebased rocket carrying force.[59] The Soviet response to the danger posed by U.S. carrier strike forces was the cruise missile which could be mounted on submarines, surface vessels, or aviation platforms. At the time, the Soviets assumed this was a highly accurate, cost efficient, reliable, and relatively invulnerable to American countermeasures. But as a result, it contributed to a debate concerning naval doctrine which began in 1961.[60]

A further consequence of Khrushchev's anti big ship naval policy was the fall of Admiral Kuznetsov, a balanced fleet advocate and a disciple of a multi-mission naval aviation force, in 1956. The new C-in-C of the Navy, Admiral Sergei Gorshkov, a consummate politician and a team player in the Byzantine world of Kremlin politics, was more willing to follow orders and to continue with Khrushchev's position on cruise missile development. However in 1958, Gorshkov began making claims that the Soviet Union was a major naval power, and consequently, the navy deserved a mission and materials which reflected that view. This trend, combined with the increased threat of long range shipboard aircraft and Polaris submarines, and their

inability to effectively counter the American challenge, resulted in a Soviet shift to a forward deployment strategy in 1961. By waiting, and being a loyal party man, Gorshkov was able to obtain his objective of what he defined as a balanced fleet, including ASW cruisers.[61]

In the early 1960's a major reoganization of naval aviation occurred. A principal modification was the transfer of fighter aviation, numbering between 1,500 to 2,000 aircraft, to PVO Strany.[62] This move was significant since it not only reduced SNA, but allowed it, according to Jacob Kipp, "to concentrate on certain vital missions: long-range reconnaissance, anti-carrier operations, and anti-submarine warfare."[63] Likewise the shift of navy's fighters to the PVO created a more effective integrated homeland air defense system.

While these developments were unfolding, the Soviets began to wage an effective campaign challenging the significance of aircraft carriers in nuclear war. Soviet naval officers claimed that they were extremely vulnerable, and as a consequence, were not a viable weapons system for the Soviet navy.[64] This was particularly true of the Soviet position, when Sokolovskii's views are taken into consideration while addressing military strategy and modern war. Sokolovskii, in determining what a future war may entail, claimed:

> The present era is characterized by an enormous growth in the productive forces of society which stipulate the appearance of new superpowerful means of mass destruction, and also by radical changes in the conditions of political struggle brought about primarily by the formation of a world system of socialism. Under these conditions, the political aims of the sides in a future world war will be achieved not only by defeat of the armed forces, but also by complete disorganization of the enemy's economy and the lowering of the morale of the population. Therefore, the essence of war as a continuation of the politics by means of armed violence and the specific nature of war appear today more distinctly than in the past, and modern means of violence acquire ever-increasing importance.[65]

Sokolovskii depicted the principal threat to the Soviet Union as coming from the United States and "The aggressive course of American imperialism, which reflects the striving of U.S. capitalist monopolies for world domination."[66] Another element which must be considered is that the Soviets did not have carriers at the time, and possibly believed that with the military-technological revolution, they would be able to offset the American lead in carrier development. But since then, they were able to witness the relative ease in which the U.S. Navy was able to support land operations in Lebanon, block Soviet aims during the Cuban Missile Crisis, and aid the U.S. Army in Viet Nam. The Soviets reassessed the role of the carrier. This was enhanced when the Polaris system went on line in the 1960's, forcing the Soviets to devise a comprehensive anti-submarine warfare program to neutralize this threat.

While the Soviet Navy was still coastal and carriers were viewed as obsolete as battleships, Soviet naval officers and political leaders saw no reason to develop carriers. The appearance of the Polaris SLBM, the expansion of the navy, and Soviet global commitments forced a drastic reassessment. It would be unfair to assume that since World War II Soviet naval aviation was waging a constant struggle within the Defense Ministry to include carriers in their arsenal. However, what we find in its place is the application of high technology to fit Soviet naval requirements. David Holloway notes that "the Soviet view of war is not a purely technological one."[67] But as a consequence of the military-technological revolution:

> Soviet theorists do not equate the level of technology with military effectiveness, for that is seen to depend on many other factors: the quality of weapons, the way in which they are organized into forces, the skill and training of the troops.

> Moreover, as technological change grows more rapid, so responsibilities of military thought are seen to increase, because attention has now to be directed to future technological possibilities.[68]

Soviet naval aviation was to be used to offset Western naval strength. In the 1960's the missions assigned to SNA were for search and destruction of enemy surface vessels, ASW functions, reconnaissance, and mining. Those missions remain relatively unchanged since then, but contributed to what has been termed "The Great Tactical Debate," which commenced when Rear Admiral K. A. Stalbo fired the first salvo in 1961 in Morskoi sbornik. His position, which has long since changed, challenged the age-old military concept of concentration and mass. This indicated that the naval air force would assume an important role in delivering a decisive, nuclear strike to any adversary of the Soviet Union.[69]

Stalbo's position was simply a naval variation of Sokolovskii's found in Military Strategy. Since Sokolovskii asserted, "Nuclear weapons can be used in a modern war to solve problems of every scale: strategic, operational, and tactical." He also stressed, "From a purely military point of view, the use of nuclear weapons can give incomparably greater results than conventional means of destruction." It was evident at the time of the debate, and at the moment, that the Soviets develop their weapon systems to fit their specific needs. And as Holloway observed, "At the same time they recognize that they have to adapt their thinking to existing technological realities." This view is as true today as it was in the 1960's, and leads to the question of who really needs carriers, naval aviation or the surface admirals?[70] A further possible deviation from this earlier position was the publication of G. N. Khor'kov, Sovetskie Nadvodnye Korabli v Velikoi Otchestvenni Voine, in 1981. Khor'kov's study was designed for senior officers and students at naval training schools to reexamine naval combined

arms operations during World War II. This indicates that a strategy, which was considered outmoded with the advent of nuclear weapons, has regained a measure of its previous stature.

With the importance of submarines in Soviet war fighting scenarios, naval aviation reached a new degree of prominence within the naval establishment. The Soviets reevaluated their ealier position concerning carriers and saw them as excellent in a support role of their submarine arm. As a result, they closely followed the carrier debate in the United Kingdom in 1960. The Soviets utilized the British discussion to develop their own approach to develop a task specific platform to counter the American SLBM menace.[71]

Ultimately the final decision to build carriers rested with the realization that control of the sea cannot be obtained without control of the air.[72] The period of forward deployment extended the naval defensive perimeter of the U.S.S.R. to a range of 1500 nautical miles from Moscow. This was further increased by an additional 1000 nautical mile concentric defensive zone in 1967-68, and it was hoped that this would curtail the dangers from carrier strike forces, as well as the first generation of Polaris SLBMs. Michael MccGwire noted, "As originally planned, it was probably hoped that ten years would be sufficient to develop a range of measures which, beginning about 1972/1973, would allow some kind of final response to Polaris along all three lines of attack. These hopes were unduly optimistic."[73] The inability to develop a comprehensive ASW detection system in such a vast area of water eventually forced the Soviets to counter with the first generation of ASW platforms, the Moskva class which was first laid in Nikolayev in 1962/1963. The Moskva and her sister ship, the Leningrad, were designed as anti-submarine cruisers, which accurately

described their functions, and were armed with standard ASW armaments, AA, ECM systems, and a complement of Ka-25 Hormone helicopters to counter American submarine forces.[74]

The second generation ASW cruisers caused more concern in the West than the Moskva and Leningrad. The Kiev class, of which the Kiev was the first, has led to a vigorous debate in an attempt to analyze her mission. By its design and armaments it was a most versatile warship with a primary mission of waging anti-submarine warfare as well as anti anti-submarine warfare (AASW). In this role, the Kiev would attempt to overwhelm the U.S. Navy's primary ASW forces. Harlan Miller said, "The Forger would be able to handle any carrier-based or land-based ASW aircraft. Our P3, in all its versions, has no air-to-air defenses whatsoever." This conclusion was derived from Admiral Gorshkov's view of the pivotal weakness of the German navy during World War II: the failure to coordinate operations between their U-boats and air assets. Gorshkov, in an afterthought, was most concerned about gaining access through the Greenland-Iceland-U.K. gap for his submarines. Thus the Kiev and other auxiliary vessels were to directly assist in carrying out this assignment.[75]

The Kiev had other marginal capabilities to perform such as amphibious support, PVO, and sea denial. With her extensive armaments, the Kiev was an excellent vessel to maintain control of a given area when, according to Miller, "She [was] the biggest kid on the block as long as the really big boys are busy elsewhere."[76] This in itself made the Kiev and her sisters so valuable to the Soviet navy as a vehicle of force projection in areas distant from Soviet shores.

About 1971, the Soviets came to the realization that the principal danger came from nuclear attack submarines, that with the aid of American

aircraft carriers, they negate Soviet ASW measures and threaten their SLBM bastions. The Soviets believed that the American carrier-based air units would quickly gain sea and air supremacy. If there exists any justification in this position, MccGwire believed that the Soviets "would need a comparable capability, including effective sea-based air." It is fair to assume that as the fear of this possibility mounted, the navy received in 1974 a ship with the capability to launch and recover VTOL aircraft and helicopters.[77]

In 1979 Vice Admiral Stalbo once again raised certain questions concerning the importance of aircraft carriers which started a new internal debate in Morskoi sbornik. As indicated earlier, this was a complete revision of his earlier opinions, which challenged the importance of aircraft carriers. Carriers, according to Stalbo, could be utilized for a wide range of missions besides nuclear strikes.[78] He further argued that it would be more prudent to build a 50,000 ton carrier than another Kiev. His arguments were based upon the premise that a larger platform could handle more aircraft, with only a 25 percent increase in cost.[79]

Admiral Pushkin presented the submarines case. Pushkin, in a series of articles concerning submarine operations during World War II, concluded that Stalbo overemphasized the importance of aircraft carriers and overlooked specific weaknesses of carriers to submarine attack.[80] However, the importance of Pushkin's counter-arguments rests with a reaffirmation of the standard Soviet concept of naval orthodoxy expressed in Sea Power of the State, in which surface vessels lost their predominance and were replaced by nuclear submarines and land-based aviation.[81]

It appears that Stalbo was justifying the construction of a mid-size carrier and the corresponding task force to respond to American SLBMs and

to incorporate into their mission presence and suasion. He justified his position since the fleet would be on distant stations during peacetime far from Soviet bases to counter the submarine menace. This view is interesting, since it further demonstrates the Soviet fascination with conventional naval warfare at sea, and the potential it offers for shipboard aviation in this concept. Stalbo encouraged discussion in this area, and no doubt was surprised by the outcome.[82]

Even before the fighting in the South Atlantic, the Soviets were concerned about the protection of those naval forces distant from adequate land-based air cover. The revolution in military affairs that was made possible with the advances in science and technology affected the Soviets as well as the West.[83] The Soviets realized the challenges of devising an effective air defense system against low flying ASMs, Exocet missiles, which caused such damage to the British Naval Expeditionary Force. Soviet authorities concluded that "command and control systems for air defense (PVO) and anti-missile defense (PLV) are major problems facing the Soviet Navy."[84]

Primarily the historical mission of Soviet naval aviation remained unchanged since the post-Civil War period; SNA was assigned to protect the Soviet homeland and surface assets from attacks from the sea. What systematically had occurred during its history was that as the threat had changed in scope and character so had the mission. Despite the reductions SNA experienced in the 1960's, air units were consistently updated and refined, particularly with the addition of Backfire bombers in anti-ship operations. In the 1960's the Soviets were confronted with the problems presented by the Polaris and Poseidon SLBM systems. Even with the addition of the Trident, the Soviet response had been distant oceanic deployment and

construction of their own Typhoon class. This further magnified the importance of Soviet naval aviation to neutralize the challenge posed by the latest SSBNs and the new generation of "hunter killer" submarine which threatened the Soviets' second strike capability.[85]

In spite of the concern that has been engendered by the "build up" of the Soviet military establishment in the West, few analysts have addressed the role of training and psychological preparations in fielding those forces. In many respects the Soviets place a high premium on training, which itself may be an acknowledgment of their technological limitations. This was reflected when Marshal A. A. Grechko stated, "Sometimes the military might of an army and navy is claimed to be a matter of their weapons and hardware. This view is unsound for the simple reason that weapons and equipment in themselves do not decide the success of combat action." The answer according to Grechko was, "It depends upon the men who operate them."[86] It is to the training and psychological foundations of Soviet naval aviation that we now turn.

NOTES

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CHAPTER TWO

FLIGHT PSYCHOLOGY

What the West refers to as "flight medicine" is more aptly described in the Soviet Union as flight psychology. Since the mid 1970's Soviet naval authorities have been extensively interested in the psychological problems associated with flight performance. These problems can be directly related to various situations found in the course of flight. These range from tension and stress resulting from flying in bad weather, personnel problems, poor interpersonal relationships, the need to quickly comprehend data from the instrumental panel, and simple human fear.

In the numerous articles that appear in Soviet open source literature concerned with this subject, the words sovershenost' (perfection) and bezopasnost' (security) are central themes. They denote the Soviets' overwhelming interest in improving pilot training and limiting the influences causing pilot error. Although these articles describe land-based, fixed-wing aviation, the relevancy to shipboard air should not be overlooked.

In understanding the psychological capabilities of their pilots, the Soviets use the principles of psychology as they relate or apply to social interaction, engineering, education, industry, and the military. The goal is to develop an understanding of man's interaction with his immediate environment and the machine which he must operate. In engineering psychology, the Soviets place considerable emphasis upon the functions of thinking, memory, emotion, attention and perception in the utilization of machines. Whereas in industrial psychology, they wish to ascertain the factors which contribute to accidents. Educational psychology is designed to facilitate training procedures.[1]

Military psychology further amplifies and consolidates many of those areas which prepares the trainee for the rigors of modern combat. It also borrows ideas from other fields that will increase personal performance and aid in the mastery of complex weapon systems. A subdivision of this discipline is naval psychology. In 1977 the Soviet Navy published their own psychological study entitled Osnovy Voenno-Morskoi Psikhologii. The authors, G. A. Bronevitskii, Yu P. Zuev, and A. M. Stoliarenko, stressed that analyzing the psychological features of the action of sailors in modern conditions demonstrated that extensive research is demanded in this area on the basis of Marxist-Leninist methodology, Soviet military science, the physiology of the central nervous system, and social and military psychology.[2] Although naval psychology is steeped in Leninist precepts, it is geared for the specific psychological problems which limit the performance of Soviet naval personnel. The authors noted that psychological development is a consequence of external variants upon the individual and they concluded that it "is not a passive product of the surrounding influences, but a result of the active interaction of the person with them. It forms and develops the exact consequence of such interaction."[3] The principle of naval psychology is to find those variables which either impede or adversely affect sailors and naval aviators and will ultimately improve their performance in training and combat.

The authors, Colonels N. Shchemelev and D. Lukashchuk considered tension to be "the major feature of aviator's difficulties." Soviet medical experts are concerned with analyzing an aviator's work effectiveness in complicated situations, ranging from sudden weather variations to onboard instrument malfunctions. This includes an individual's response to excessive emotional overloading, the aviator's confrontation with numerous

stimuli which forces him to react in one manner or another. They conclude that under such stressful conditions the likelihood of flight accidents is bound to increase. According to the conclusions of Shchemelev and Lukashchuk, "the question of increasing the psychic stability of aviators is one of the important tasks in guaranteeing the security of flights."[4]

Other sources note that tension resulting from the training process may adversely affect the trainee. This is especially true in the course of flight training where the activities and attitudes of flight instructors can contribute to pilot error.[5]

Other elements exist in the pilots' immediate environment that contribute to excessive levels of tension and stress sometimes impairing his ability to function effectively. After reviewing incidents of what they identify as pilot error, the Soviets have concluded that there are a number of pervasive factors that contribute to adverse flying situations. One, as we have already seen, is the role of the instructor (to be examined in Chapter Three). From all available accounts other influences are involved and Soviets are well aware of the dangers of fatigue, for instance, upon aviators during the course of a mission.

Bronevitskii and his co-authors felt that another major problem confronting naval personnel was stress. They noted that the limitations imposed by this psychological phenomenon could be classified into three areas of psychic disturbances. From their research they found that the first type was associated with intellectual stress, sensory stress, and motor stress. The second form -- psychic convulsions -- related to military situations resulted in volitional and moral stress. The third form, Bronevitskii claimed was extraordinarily rare. It occurred during the personal development of the individual and was "an acute reactive condition

[psychosis] of a short term functional pathology of the nervo-psychic activities with a duration from a few moments to five to seven days, more or less." They said, "The frequency, character, and consequences of psychological shock in the decisive stage is determined by the moral-political peculiarities of the personnel and therefore not identical in various armies and fleets."[6]

Since psychological stability is a principal objective of training exercises, the Soviet Navy places considerable emphasis upon combat training. It is hoped that this technique will further benefit the pilot by developing his confidence, and will improve his performance while he is mastering complex weapon systems that are the necessary components of Soviet naval aviation. This, in Soviet calculations, may ultimately heighten combat effectiveness and deter potential aggressors.[7] But these potential rewards are reduced by the corresponding levels of fatigue. As a preventive measure, the Soviets are seeking to understand the proper ratio of work to rest, as well as to verify that a constant level of training exercises will limit the negative effects of fatigue.[8]

Likewise, the revolution in military technology has placed further demands upon the psychological health of an aviator flying a modern supersonic aircraft. The responsibility requires the pilot to make instantaneous responses after consulting his instrument panel. The result usually is an increase in tension directly related to his attempts to master his craft. Studies have been made to reduce tension even by the color selection found in cockpits of Soviet fighters. Viktor Belenko, the Soviet defector who flew his Mig-26 to Japan, noted that the color green was chosen for this purpose because of its soothing qualities. Colonel General S. Guliaev believes that increased levels of tension are especially evident

during take-offs and landings which require "the pilot to implement all the operations almost to the limits of his abilities." As a consequence of the rapid growth in weapon systems, there is in the eyes of the naval establishment a need for the continual growth of the "moral responsibility" of the naval personnel to apply them. Thus, any failure in the psychological readiness of flight personnel can have a negative effect upon the mission and can ultimately result in failure.[9]

The successful implementation of the exercise, Soviet authorities believe, is directly attributed to the work of commanders, political workers, officers, and all the personnel of the unit. Even then this does not guarantee that they will succeed. Guliaev observes, "After the most thorough preparations of the pilot on the ground it is impossible to say precisely whether he can with certainty manage the machine in the air." It is only in such situations that trainees are able to acquire the necessary flying qualities.[10]

At the moment, the moral-psychological stability of aviators has reached new heights in understanding the reasons for flight accidents and the desire to improve combat readiness. Guliaev stresses that moral-psychological stability "must exist where people manage modern technology which has been established on the basis of the latest scientific achievements."[11] This corresponds to the official position expressed in Man and Sea Warfare, "Neither a missile nor a combat aircraft can inspire greater terror in the enemy than a soldier with high morale and consummate combat skill, who is capable of getting the most out of his weapons and equipment."[12]

Soviet naval physicians are interested in the difficulties imposed by technology upon aviators and the impact of emotional and psychological

overloading. This can be the result of sudden changes in the pilot's immediate environment during the course of the flight and the need to make calculations of the situation as quickly as possible. An outcome is the reduction in reaction time and the interval in analyzing the rapid flow of information during the mission. A failure to resolve this problem effectively often results in serious and "undesirable consequences."[13]

The usual response is to strengthen the individual, particularly his physical characteristics. This can be accomplished by extensive physical training. Senior Lieutenant P. Kovalenko of the medical service notes that strenuous physical exercise has profound impact upon the human body. Distance running, cross-country skiing, swimming, gymnastics, and other sporting activities result in measurable internal changes of individuals, especially in relation to blood pressure and pulse rate. The pulse rate, the generally accepted barometer of a subject's exercise level and the extent to which he has worked, is appreciably lower. Usually the pulse rate on the average of 35 to 45 beats per minute is quite common in a serious, well conditioned athlete. The impact of such findings leads Kovalenko to conclude that by expanded athletic opportunities pilots will improve their flight performance in the areas of concentration, reaction time, reducing the effects of oxygen debt, and improving the likelihood of future success during flight exercises.[14]

The emphasis on sports activities and heightened physical training has far reaching ramifications in Soviet naval aviation. It is hoped that these programs will further the aviator's longevity and even guarantee his success in operating his aircraft. Also Soviet experts believe that athletics can create the proper milieu that will insure victory in combat

operations by giving them a psychological edge over their Western opponents. Extensive physical training can possibly aid the pilot in other complicated situations. Physical exercise contributes to the necessary "psycho-physical qualities" that are required in all types of flight.[15]

A method that is employed to prepare aviators for complicated or unforeseen conditions is to place excessive pressures on them. This procedure is identical to those used in combat training. The physiological principles involved are similar to a distance runner preparing for a ten kilometer road race. The runner generally begins his workouts by a series of runs which exceed the distance he will cover. This method is referred to as overdistance. Another training method is interval training, where a runner continually runs a set distance repeatedly at an established pace. By adhering to this concept, the pilot can cope with the additional stress placed on the body's normal psycho-physiological functions that results from an unexpected incident during a flight. The aviator, it is assumed, will act calmly and professionally. However, Kovalenko relates that following training the trainee's ability in this area is considerably reduced if the scale of physical activities is not marginally maintained. It would be fair to assume that preparations in this field are an ongoing process, especially with repeated Soviet emphasis upon swimming, running, cross-country skiing, and gymnastics.[16]

It seems the Soviets perceive the role of exercise as an instrumental factor in the psychological health of their aviators. Such studies conducted in this field can be utilized to assist the Soviets in analyzing the problems related to the "neuro-emotional" condition of their personnel. They also have a serious interest concerning the psychological state of the pilot at the time of takeoff. Soviet specialist Shcherbark notes that the

pilot's psychological balance is more significant at the precise moment of takeoff than at any other time. The body's psychological systems become activitated and are considered to be "necessary elements in the preflight state of pilots and navigators." Even though those functions are involuntary, he feels that they can be consciously directed by the pilot. Prior to the flight, Soviet physicians examine the pilot for any physiological changes that may indicate that the pilot is experiencing some form of unexplained stress which can adversely affect the assigned task.[17]

Sensory overloading is a serious problem undergoing Soviet review. It has been observed that in severe conditions the pilots are overwhelmed by the data and the necessity to make fast, accurate, and correct decisions. Consequently the external elements drive the individual to the limits of his psychological capabilities. If the strain in his immediate environment keeps increasing at an alarming rate, the pilot will ultimately lose control while his psychological defenses are overcome.[18]

For the Soviets it becomes paramount to discover the effects of fear and stress on aviators and to develop countermeasures to deal with those phenomena. In their training scenarios they emphasize the need to employ the element of surprise. This is accomplished by requiring the pilot to work as quickly as possible, while introducing a series of dangers and threats with which an aviator must cope. To enhance a feeling of psychological strain, tasks are to be completed in the most complex conditions.[19]

Other authors feel the best way of handling stress is to begin with preflight instruction. The Soviets place considerable emphasis upon training as a preventive measure. This should permit the pilot to recognize the source of his difficulties, in what Shcherbak euphemistically refers to as "special events" during a flight, and to take the proper

action to satisfactorily resolve the situation.[20] In a similar vein, the pilot must be able to judge his own abilities and react accordingly. In modern aircraft, the speed of reaching a decision is considered vital to success. Pilot preparation in regard to evaluation procedures is a crucial function, but they are aware of the difficulty of the task. Training pilots to make accurate calculations is impossible since aviators, like most others, are subject to individual differences which limit a standard approved response.[21]

Shchemelev realizes that because of the human element, a pilot's reaction to fear will vary. In extreme situations, in regard to training and psychological readiness, he avers that "the efficiency and the quality of work" is reduced. Furthermore, in actual critical situations the Soviets have discovered that the aviator can possibly lose control over his actions. Even though the above is an example of a pilot's response to fear, others, in comparable environments, will draw upon a reservoir of internal strength to reverse the harrowing experience. From their own observations, the Soviets identify two forms of response to fear. The first is a heightened state of excitability, culminating in a series of impulsive actions. The second concludes in a noticeable reduction in reaction time which impairs the aviator's ability to take appropriate countermeasures.[22]

Training is viewed as a crucial factor in limiting the adverse effects of stress, especially in situations that are perceived as threatening. Through the proper level of instruction, the pilot and the trainee can differentiate between dangerous and, generally, nonthreatening situations. As a consequence of adopting psychological preparation, the aviator is able to a make the proper response.[23]

Responses may be developed for the psychological effects of tension, stress, and fear by a concerted effort of commanders, doctors, Komsomol organizers and political workers. This is a significant element in increasing the moral-psychological readiness of flight personnel. In joint sessions they discuss their mutual experiences, examining various points of view that have been expressed by the participants, and emerge with a series of concrete proposals that will aid other aviators in similar situations.[24]

A considerable burden is then placed upon commanders, since it is they, with the aid of flight physicians, that must outline the proper activities that will improve the physical and psychological character of their personnel. Kovalenko notes that along with the medical staff, commanders should allot time for sports related activities which will improve pilot performance in complicated, unexpected situations. The importance of psycho-physical training is best expressed in the observations of Kovalenko, "Omissions in this [area] can lead to undesirable consequences." The solution is to have commanders and doctors develop the best training methodology which will improve the pilot's personal qualities and will perfect their skills during pilot training.[25]

Flight training becomes a crucial aspect of an aviator's education. In the course of the flight program, the trainee is not only being prepared to master his aircraft, but also is expected to develop the physical and psychological attributes that are necessary to face the challenges of modern aviation. The purpose of training is to identify and to eliminate the causation for flight accidents as well as to compensate for the technological edge of Western naval air forces. The ultimate mission of training is to remove the human element from the equation in air operations. To further comprehend the Soviet naval aviator, one must be aware of the role and effects of flight training upon the process of pilot development.

NOTES

[1]V. V. Shelyag, A. D. Glotochkin, and K. K. Platonov, Military Psychology A Soviet View (Washington, D.C.: G.P.O., 1972), p. 13.

[2]G. A. Bronevitskii et. al., Osnovy Voenno-Morskoi Psikhologii (Moscow: Voenizdat, 1977), p. 4.

[3]Ibid., p. 5.

[4]N. Shchemelev and D. Lukashchuk, "Stress i bezopasnost' poletov," Morskoi sbornik, no. 3, March, 1978, p. 52.

[5]A. L'vovskii, "Kachestvo obucheniia i bezopasnost' poletov," Morkoi sbornik, no. 6, June, 1978, p. 51.

[6]Bronevitskii, pp. 294-295.

[7]Yuri Sviridov, ed., Man and Sea Warfare (Moscow: Progress, 1978), p. 90.

[8]Y. Shcherbak and A. Zhitnitskii, "Psikhologichesdaia gotovnost' k poletu," Morskoi sbornik, no. 7, July, 1980, p. 53.

[9]S. Guliaev, "Polet i psikhologiia," Morskoi sbornik, no. 7, July, 1978; John Barron, Mig Pilot (New York: Avon, 1980), p. 15.

[10]Guliaev, p. 49.

[11]Ibid., pp. 46-47.

[12]Sviridov, p. 8.

[13]P. Kovalenko, "Fizicheskaia podgotovka letchika," Morskoi sbornik, no. 7, July, 1979, p. 65.

[14]Ibid., pp. 63-64.

[15]Ibid., p. 63.

[16]Ibid., p. 64.

[17]Shcherbak and Zhitnitskii, pp. 52-53; Barron, p. 12.

[18]Shchemelev and Lukashchuk, p. 54.

[19]Sviridov, p. 87.

[20]Shcherbak and Zhitniksii, p. 52.

[21]Guliaev, p. 46.

[22]Shchemelev and Lukashchuk, pp. 53-54.

[23]Ibid., p. 54.

[24]Guliaev, p. 46.

[25]Kovalenko, pp. 65-66.

CHAPTER THREE

TRAINING

Training to be a Soviet naval aviator begins at the military or higher military academy level. Usually, the ages of applicants to fill the yearly quota of vacancies vary from seventeen to twenty-one for those entering as cadets, and twenty-three through twenty-five for those with prior military experience and still on active duty. The admittance procedure is based upon a process of competitive examination. The party organs, the Komsomol, and paramilitary formations, DOSAAF, are encouraged to have the more promising individuals apply. By following this procedure, and advertising vacancies in Red Star and other military journals, it is hoped that there will be at least three applicants per vacancy. Study aids are also sold in bookstores designed to assist the potential student to prepare for the examination.[1]

To become a naval aviator, the future pilot begins his training at one of the eleven or twelve aviation schools of the VVS for pilots. The actual course work at this point in a naval pilot's professional development is uncertain, but the duration of the period of study is four years. Upon completion of the academic program the graduates are commissioned as either pilot-engineers or navigator-engineers. Engineering institutions are considerably different than pilot/navigator schools.[2] The actual education of pilots and navigators is similar to that of other naval officers which stress, heavily, mathematics and the applied sciences. The logic for such a curriculum derives from the recognition of the pervasive influence and complexity of the scientific-military-technological-revolution on military training. The trainee must have a thorough understanding of the latest

state-of-the-art equipment ranging from supersonic aircraft to anti-submarine warfare systems. As a prerequisite the trainee is expected to have mastered physics, chemistry, mathematics, and other sciences.[3]

The educational ojective of Soviet naval aviation is to develop a well proportioned system of flight instruction that will guarantee the best possible results in the area of instructional-military exercises. Colonel A. L'vovskii, a combat pilot, emphasizes that the application of methods and principles of training recommended by instructors and psychologist can have a positive effect in specific situations in training. This further emphasizes the close relationship between the military and the social science community in improving instruction and creating a superior aviator.[4]

In understanding the training of naval aviators, one should be aware of the role of the instructor who is responsible for the trainee's development. One of the fundamental requirements of their pedagogical program is to never deviate from the accepted plan of studies. It appears that by devising a system of instruction, the trainee is constantly being reinforced in the correct flying methodology as a means of avoiding flight accidents.[5]

As L'vovskii notes, the instructor is expected to know the abilities of all of his trainees as well as the progress each is making during the training cycle. Another responsibility delegated to the instructor is to "struggle against" the negative attitudes of trainees. This seems to be a duty of the political officer and the Komsomol organization, but instructors have been assigned this function to review the records of their subordinates in attempting to solve the problem before it impairs a trainee's progress. The instructor must likewise understand that the trainee will

make mistakes since this is a basic characteristic of human nature and errors in the air are inevitable. This persists despite the contrary feelings of the trainee to do his best in all situations.[6]

The instructor should utilize his wisdom in timely promotions, and in the process, must try to avoid personality conflicts. In addition, he must attempt to restrain his emotions, principally during the most difficult circumstances that are common during training. By doing so, he will enhance his objective with the improvement of the educational environment, and correspondingly increase the efforts of his students. It is apparent that even the presence of the instructor, when the trainee is on flying status, can cause a disruption in the rhythm of the pilot, and likewise, neglect his responsibilities to the other members of the crew. Furthermore, the instructor's presence may ultimately impair the trainee's progress. But the instructor is encouraged to remember that he must not take upon himself the role of the aircraft commander, especially in those circumstances when it is absolutely unnecessary during training.[7]

While in the air, however, the instructor must be constantly vigilant and concerned about the potential mistakes that may result in flight accidents. This duty can force the instructor to take control of the craft if, in his judgement, the trainee is unable to cope with the situation.[8] On the other hand, the instructor is encouraged to allow the trainee to discover for himself the appropriate actions in given instances. As L'vovskii stresses, "The most professionally important qualities of a pilot are formed this way."[9]

Ground training continues even for the more advanced pilots. Lt. General A. Ruchkov, Commander of Naval Air Forces for the Northern Fleet notes that SNA places a premium on the mastery of the advanced techniques

of sophisticated flight-navigational systems and of aerodynamic meteorology. The emphasis here is upon the development of near instantaneous response time in handling instruments in aircraft and helicopters. Once again, the object of this type of training is directed toward a favorable outcome when the pilot experiences the adversity of flying in bad weather. However, to operate effectively, the trainee must become an active participant. If not, the consequences can be less than what is accepted and desirable even by Soviet standards.[10]

Instruction is designed to follow a set plan which will assist the trainee when, at some point, he will fly in complicated situations relying upon his instrumentation panel. By this time, the pilot is expected to have more than one year of flying experience, particularly when flying into cloud banks. A crucial element of the instructional process is that it should not be dependent upon, as Ruchkov claims, "the individual qualities of the person."[11]

Flight instructors are expected to review critically the different types of flights, which will generally improve flight training. Consequently it is imperative to have the training cadre evaluate all aspects of the trainee's progress. This self-analysis should be done as professionally as possible. Since training is interpreted as a continual ongoing process, the commander is expected to play a vital role in the development of naval aviators. L'vovskii relates, "This is the most important element in the formation of the trainee." Any reduction in the educational preparations would indicate that the commander is failing to take an active part in the training schedule and is running the risk of creating the "prerequisite for flight accidents."[12] This underscores the crucial role the commander plays in training, and is particularly evident in the areas

of independent instruction where the commander is the final arbiter in determining when the trainee has reached the point where he is ready to solo in simple meteorological conditions.[13]

Both the commander and the flight instructor are jointly responsible for the maintenance of the psychological readiness of their subordinates. Instruction is also geared to prepare the pilot to utilize modern technology and military techniques, but the commander has a profound impact upon the psychological growth of the trainee. Commanders are invited to listen to their subordinates and not to intimidate them with their rank. By fostering a positive atmosphere, the commander can improve the general working environment, and as a consequence, reduce the potential for flight accidents. Instructors are encouraged to use positive reinforcement by understanding the necessity to reassure the trainees in their performance.[14]

As previously stated, bad weather training is an important phase of instruction. A common method employed to achieve improved performance is the use of flight simulators, as well as instrument panel orientation, which acquaints aviators with the various functions and purposes of flight instruments. This permits the trainee to develop a familiarization with the different types of equipment that make flying in adverse weather possible. The pilot, in the process, is introduced to pilot-navigational, radio-navigational, and radio-signal systems which are crucial to successfully complete the mission.[15]

A corresponding technique which is closely adhered to during the period of ground-based instruction is modelling. Modelling is an essential aspect of all phases of military training. According to the Sovetskii Voennaia Enstiklopedia "modelling in military affairs is the process of

creating a model of a military situation; a method of using the objectives of the knowledge of military science by the help of models of the functions of these objectives." The purpose of this strategy is to improve the performance of personnel. Essentially, modelling is a theoretical exercise which is widely employed in battle, operational, and rear service phases.[16]

Mission models are commonly used in SNA. The intention is to assist trainees in mastering the necessary skills to control themselves in stressful and complicated environments. This procedure has added significance since it further strengthens the psychological stability and will ultimately lead to improvements in all phases of flight performance.[17]

Colonel Iu. Shcherbak and Senior Lieutenant A. Zhitnitskii realize that training can improve the ability of pilots and navigators to quickly evaluate situations as they arise during flight missions. These writers concur that while this quality is considered one of the most important for aviators, not always enough attention is devoted to its development. Both specialists feel that during the preparatory stage of training, trainees find their independence and initiative are stifled. However, Shcherbak and Zhitnitskii stress that flight instructors are aware of the problem. For example, they note the achievements of V. Pyzhakov and L. Blinov, who "not only take into account the individual features of every subordinate, but they also use various methodological forms of training, they properly determine the number and sequences of implementing the mission depending upon the extent of their complexity and try to grant the aviators more independence."[18]

It is significant to remember that the Soviets consider training in SNA to be well balanced between theoretical and applied instruction. This allows the trainee to emerge with the necessary skills which will insure

his successful completion of training and further improve his professional performance. The latter can only occur through an understanding of the psychological and methodological principles involved. It is noteworthy that refinements in training in certain areas such as poor weather, combat, simulators, and modelling are dependent upon the concerted efforts and combined experiences of commanders, political officers, and physicians.[19]

This is apparent in another phase of drill, preparing pilots for flight malfunctions or defects in equipment or technique. Colonel N. Shchemelev and Colonel D. Lukashchuk, both of the medical service, note which actions must be taken to ensure the completion of the task. They conclude that additional training is dependent upon a number of elements, the most significant being the complexity of revealing the defect which is characterized by the time and precise determination of its cause. The trainee should be able to recognize the source of the problem and the time required to correct it. Furthermore, he must realize that his decision-making processes may be hampered by the increased emotional level during the crisis.[20]

Finally, when the pilot has satisfactorily demonstrated his proficiency in preflight training, he is ready for actual controlled flight. The trainee is cognizant, as in the words of L'vovskii: "Nothing escapes the eyes of the evaluator." The trainee is able to draw upon the wealth of experiences of his flight instructor to improve his skill. The flight instructor must make the trainee feel that he is being evaluated fairly. This procedure operates as a means of maintaining the high morale among trainee formations. But the trainee is continually conscious that the instructor is monitoring his actions both in the air and on the ground. This additional pressure forces the trainee to make maximum use of his time

for independent training activities, as well as analyzing himself to improve his theoretical foundations.[21]

A tool which has significant implications in flight training is post-flight analysis. It appears that by reviewing their mistakes, or those of others, it allows the trainee to ascertain the reasons for flight mishaps and to use them to improve his own skills. Post-flight analysis is usually conducted as soon as possible following a mission. This enables the trainee to use this experience to improve his own ability in similar circumstances. During the debriefing mistakes are scrutinized in connection with the conduct of other pilots and crew members. The meeting usually terminates following the instructor's critique, expressing the factors which contributed to the situation, as well as the actions of the pilot, which can aid in refinements of flight methodology.[22]

Even though there are numerous elements that contribute to flight mishaps, or near mishaps, one method that can support the pilot in the decision-making process is physical training. In the previous chapter it was evident that through physiological improvement, the pilot may be able to master unexpected situations. Physical training can assist the pilot in adverse environments resulting from atomic and chemical-biological attacks. P. Kovalenko, a Senior Lieutenant in the Medical Service, states: "Training is a very important preventive measure, even increasing the capability of the organism in the presense of unfavorable environmental factors, as well as several poisonous substances, radiation and infections."[23]

Again this demonstrates the emphasis the Soviets place upon physical exercise. Kovalenko believes that a principal cause of flight accidents is the general poor state of the physical conditioning of naval aviators.

While physical fitness is a necessary element to flight safety, it also has a positive influence on long range day or night flights over the ocean at high and low altitudes. G. A. Bronevitskii and his co-authors in Voina Okean Chelovek have further identified a series of concerns with flights over water and from sea-based platforms. For example, the optical effects of waves, sun and moonlight can result in misperceptions that can explain a number of serious accidents involving helicopters and other aircraft. This can be heightened by the difficulty in landing a VTOL aircraft on the deck of an ASW cruiser, no simple task, when the pilot must judge the speed of the vessel and the effects of the prevailing winds. Guliaev insists that only an absolutely healthy person with a high level of physical development can successfully fly. To reach this goal, trainees are encouraged to participate in various sporting activities which will strengthen muscle tone and improve cardiovascular functions. It is hoped that the outcome will increase attention span and aid naval aviators to perform their tasks efficiently.[24]

Kovalenko sees physical training as a potential preventive measure in avoiding illness among air personnel. He prescribes training that is designed in both passive and active forms -- either at an individual or group level. Throughout his article, he praises the merits of cross-country skiing, distance running, swimming and other types of aerobic and anaerobic training. He feels the young aviators must continually become involved in some aspect of physical fitness, since exercise improves body tone and oxygen capacity which will heighten performance. Guliaev agrees with Kovalenko and adds, "Purposeful physical fitness solves a series of other tasks of the professional studies of air crews." The

emergence of a series of favorable qualities such as "persistence, courage, fortitude, and self-control" are the outcome of a continual reliance upon physical activities.[25]

Training, whether physical or combat, is planned to result in the overall development of the pilot or navigator. A quality which the Soviets expect as a result of their increased emphasis in this area is the likelihood that the pilot will react quickly and properly in unexpected situations. These situations can range from aircraft malfunctions to pilot error or sudden weather changes. The ability to successfully determine the causation of the problem, and then resolve it, is considered to be one of the most crucial elements in the training program.[26]

As previously stated, one of the principal causes of tension and stress is sudden and unexpected meteorological variations. Ruchkov hopes that by repeatedly emphasizing training, it may prepare the aviator to master those conditions which often result in pilot error and the possible loss of the aircraft. From a Soviet perspective successful training is perceived as a guarantee against those eventualities. Training schedules include pilot exposure to bad weather flying and the mastery of onboard ground control systems. Control panel orientation, according to Ruchkov, "expands the range of missions of naval aviation." This is particularly true regarding pilot-navigational training. He believes that testing the pilot's ability to handle his aircraft in poor weather demonstrates his proficiency and the success of training itself.[27]

The responsibility for this rests solely with commanders and flight leaders. Usually the scheduled exercises are designed to occur over water and are considered moderately difficult. The mission is held beyond the range of the aerodomes and land-based radar directional systems. The pilot

is required to work out the correct formula derived from navigational aids.[28]

In poor weather, naval aviators must be able to differentiate between reality and the illusions that are common in such conditions. Likewise, it requires certain skill to be able to fly solely by onboard control systems.[29] The Soviets, Ruchkov indicates, are well aware that inadequate training with these technological advances can cause serious difficulties for the pilot. However, with the proper knowledge of their utility, a pilot can usually insure future success while flying in bad weather.[30]

Piloting a modern aircraft according to one's instruments is more difficult than it seems, and often results in psychological instability. The pilot must be able to determine the data from flight indicators and put the information to use. As a consequence, it appears that the pilot is placed under a typical stressful situation aggravated by the rapid flow of stimuli, and the need to be constantly vigilant. Eventually when the pilot makes his first flight into cloud banks, and is flying solely by his "flying instincts," he usually discovers what Colonel B. Fedorovskii calls "unexpected results." The pilot becomes aware that he is unable to control the craft, and is not able to determine the horizon. The factors that contribute to the situation are a series of spontaneous illusions which force the pilot to be even more attentive in determining what actually is happening.[31]

The Soviets are cognizant of the psychological pressures that are placed on the pilot resulting from adverse weather and high altitudes. These range from the personal discomfort of high pressure flight suits, oxygen masks, and the necessity to accurately comprehend the data from the onboard control systems. The accepted remedy is to increase training and

the level of moral-psychological preparations. The goal of instruction, notably in prolonged flights over water, is to physically harden the aviator by his constant exposure to adversity.[32]

Another important consideration which should not be overlooked is the role of partinaia robota (party work) within the general parameters of flight pedagogy. Colonel M. Kalinin asserts that a sound foundation of "Marxism-Leninism promotes the growth of the moral-political and psychological qualities of soldiers, sergeants, and officers, to intensify their skills."[33]

Usually the basic methods employed in party agitation fall within three well defined categories. The first centers upon the press and involves the flow of books, pamphlets, and other written matter. The second is oral agitation, the most effective of the three, and is conducted through personal conversations, reports, and lectures. The third method is also widely used, poster agitation, and is no doubt the best known in the West. These methods are designed to foster the popular growth of a Communist world view, or to increase a trainee's awareness toward particular aspects of training that are of concern to the Komsomol and Party.[34]

It must be remembered that the training of Soviet naval officers is accomplished on both a professional and ideological level. It is hoped that the officer will emerge not only with a master of his speciality but also as a "political officer and dedicated propagandist," well versed in the Soviet government's position and policies in world affairs. This is facilitated by the creation of Marxist-Leninist study groups. The commander has the authority to appoint the group leaders.[35]

The most effective means of conveying the Party's message to all levels of the navy, SNA included, is the "friendly chat." According to Man

and Sea Warfare, this is accomplished because "an agitator knows the man's educational level, life experience, his weaknesses and strong points." The conclusion is that an individual is more likely to feel relaxed and will discuss his concerns or problems on a one-to-one level rather than before a large group.[36]

Another function of political officers and the Party organization is to defuse those personality conflicts that develop in the course of training. Commanders, flight physicians, and political officers all attempt to limit the damage from personal grievances that usually results in lower morale and poorer flight performance. An effective system to handle personal adjustment problems is essential in reducing flight accidents.[37]

The responsibility for the development of a systematic program of light security is a major undertaking, with political officers playing a crucial role in the training process. Their mission is to assist in the "subsequently increased psychological stability of aviators and to unify the crews."[38] Through the combined efforts of political workers, Party organizations, and commanders, an atmosphere is forged which will strive to maintain the moral-political and osychological readiness of flight personnel. In the words of Bublik this "is indispensable for achieving victory in modern battle."[39]

NOTES

[1]Harriet Fast Scott and William F. Scott, The Armed Force of the USSR, 2nd. ed. (Boulder, Colorado: Westview Press, 1979), p. 336.

[2]Jack L. Cross, The Soviet Higher Military Educational System, College Station Papers 4 (College Station, Texas: Center for Strategic Technology, 1983), p. 74.

[3]V. Ruchkov, "V Slozhnykh meteousloviakh," Morskoi sbornik, No. 9, September, 1978, pp. 43-46.

[4]A. L'vovskii, "Kachestvo obucheniia: bezopasnost' poletov," Morskoi sbornik, No. 6, June, 1978, p. 50.

[5]Ibid., p. 52.

[6]Ibid., p. 53.

[7]L'vovskii, "Kachestvo obucheniia i bezopasnost' poletov," pp. 52-53.

[8]Ibid., p. 52; Ruchkov, p. 45.

[9]A. L'vovskii, "V interesakh bezopasnosti poletvo," Morskoi sbornik, No. 2, February, 1979, p. 45.

[10]Ruchkov, pp. 43-45.

[11]Ibid., p. 45.

[12]L'vovskii, "Kachestvo obucheniia i bezopasnost' poletov," pp. 51-53.

[13]Ibid., p. 50; Ruchkov, p. 44.

[14]Guliaev, p. 50.

[15]Ruchkov, p. 44.

[16]Sovetskiia Voennaia Entsiklopediia, p. 348.

[17]L'vovskii, "V interesakh bezopasnosti," p. 45.

[18]Shcherbak, p. 52.

[19]L'vovskii, "Kachestvo obucheniia i bezopasnost' poletov," p. 51.

[20]Shchemeley and Lukashchuk, p. 55.

[21]L'vovskii, "Kachestvo obucheniia i bezopasnost' poletov," p. 51.

[22]Ibid., p. 52.

[23]Kovalenko, p. 64.

[24]Kovalenko, pp. 63-64; G. A. Bronevitskii, I. Ia. Ivanov, N. N. MaKeev, and A. A. Stoliarenko, Voina Okean Chelovek (Moscow: Voenizdat, 1974), pp. 177-178; Guliaev, pp. 49-50.

[25]Guliaev, p. 50; Kovalenko, pp. 63-64.

[26]Shcherbak, p. 52.

[27]Ruchkov, p. 31.

[28]Ibid.

[29]Bronevitskii et. al., p. 179.

[30]Ruchkov, p. 45.

[31]B. Fedorovskii, "Poletu po priboram," Morskoi sbronik, No. 1, January, 1983, pp. 48-49.

[32]Bronevitskii et. al., p. 182; Ruchkov, p. 44.

[33]Kalinin, p. 33.

[34]Sviridov, p. 50.

[35]Ibid., pp. 39-40.

[36]Ibid., p. 56.

[37]Shcherbak, p. 54.

[38]Ibid., p. 52.

[39]L. A. Bublik et. al., Partiino-Politicheskaia Rabota v Sovetskoi Armii i Voenno-Morskom Flote (Moscow: Voenizdat, 1982), p. 203.

CHAPTER FOUR

SHIPBOARD AVIATION -- RETRAINING

Soviet naval aviators are trained in air force schools. However the question remains: Are shipboard aviators trained at advanced institutions? One such school, which has been identified by the D.I.A., is the Kiev Higher Military Aviation School (Keivskoe Vysshee Voennoe Aviatsionnoe Inzhenernoe Uchilische).[1] It appears from official Pentagon sources that the training is primarily centered upon the sciences and applied mathematics. General and military pedagogies as well as psychology are also included. Sports and other physical fitness related activities are incorporated in the curriculum and have become an integral aspect of the overall training program. The graduates, upon completion of the five-year program, are commissioned as lieutenant-engineers. Their diplomas classify them as either pilot-engineers or navigator-engineers. In 1968 a correspondence course was instituted. A postgraduate school is open to officers who have graduated from a higher engineering school with a minimum of two years in their field and have not yet reached the age of 36. In 1972, it was reported that for each vacancy there were at least eight applicants.[2]

From this educational system possible naval aviators are selected for advanced training for shipboard aircraft. Within the last two years a subtle public airing of opinions has been waged in Morskoi sbornik concerning the retraining process. In an article "Letchik pereuchivaetsia" jointly authored by Colonel P. Ivanov and Colonel-engineer V. Nemchenko in January, 1981 the problems of retraining (pereuchivanie) were examined. Their conclusions mirror similar concerns of land-based aviators and have contributed to further articles reviewing the problems of retraining.

The selection of pilots for retraining to shipboard aircraft, in this case, the Forger YAK-36, should be a young officer who is experienced. This is the opinion of Colonel N. Shchemelev of the medical service. He feels that the selection of younger officers who have the necessary skills is crucial in the retraining process.[3] Earlier he notes, "This means, in our opinion, during the selection of aviators for retraining, special attention must be paid to the extent of their automatic skills, showing preference to the young, but which already have the specific experience of specialties."[4]

Shchemelev favors a detailed program of testing which will, he believes, help eliminate those aviators who lack the necessary skills or the positive attributes of shipboard aviators. It is in this area that the medical services provide a valuable service by devising the criteria and testing procedures which can reach that goal. Unfortunately, the psychological sciences are far from being precise in this regard, as Shchemelev has seen in his own study of Forger pilots on the Kiev. However, by the constant efforts of medical specialists they may be able "to master the essential methods and persistently instill them into their [the pilots'] lives."[5]

What actually makes this unique is the attempt to improve the selection of officers for retraining. As Shchemelev concludes, the work of flight physicians and flight instructors working together will further insure the selection of competent officers to serve with deck aviation. The object is to develop the necessary abilities of those pilots to the highest level and, conversely, led to an improved stage of combat readiness of naval aviators.[6]

As we have seen in chapters two and three, psychology and training go hand-in-hand. The same process, it is fair to say, occurs during retraining. However the problems that are identified on the ground are further magnified on sea based platforms. The margin for error is greatly diminished, and the necessity to operate VTOL aircraft or helicopters effectively is crucial for the navy's mission. Usually these center around the pilot's earlier acquired habits. Colonel B. Fedorovskii, a combat pilot first class, notes that the previous attributes are either positive or negative and that "the earlier acquired skills appear as the practical basis of mastering specialties."[7]

The seriousness of the problem concerning the psycho-physical readiness of aviators is dramatized by the findings of flight mistakes by Ivanov and Nemchenko. From their investigations they conclude that 19 percent occur at the time of take-off, 21 percent occur in flight, and 60 percent during landings. Since such a large number occur during landing, the reasons according to the authors, are the increased levels of emotional strain and the necessity of making quick and accurate decisions in a short period of time.[8] In this stage of pilot development, Soviet authorities are interested in the psycho-physical characteristics of retraining.

In a similar vein Colonel A. Goltvenko and Captain A. Zhitnitskii indicate that there are four areas that are the foundations of sensorimotor skills. From their research they outline those levels as preliminary, analytical, systematic,and automatic. The importance of these, according to their studies, is that they "ease or complicate the conditions of some operations."[9]

What is evident from Soviet sources is the necessity to understand the relationship between the older skills and the most recent that are acquired

during retraining. To comprehend this connection, Soviet flight physicians and specialists have employed the academic disciplines of psychology and physiology to determine the mutuality between the two, in order to improve retraining. In this light both Goltvenko and his associate, Zhitniskii, note that to ameliorate the ability of pilots, they must learn psycho-physical characteristics of flight personnel. This can be measured by the appropriate equipment capable of evaluating arterial pressure and pulse rate. The importance of such studies is that "They not only allow [us] to evaluate the level of training of the pilot, but they also reflect the reconstruction of [those] skills."[10]

In this role flight physicians perform significant duties in the general process of retraining. Shchemelev believes that they share a pivotal function in the selection process as well as analyzing the operational mistakes of the retrainees. In regard to studying the errors in performance, "the objective," according to Shchemelev, "is establishing the psycho-physical structure of the mistake and working out measures by their foresight." Likewise, with the employment of psychological research a detailed picture of a competent retrainee can be made. This assists in the facilitation of the selection of officers for retraining, particularly those likely to quickly master the new skills, as well as to ascertain the reasons why others do not.[11]

The obligation of the flight physician on an ASW cruiser is vital to both the physical health of the staff and to the assistance of the pilots in mastering their assigned functions. The latter is considered by Goltvenko as their "greatest role," especially in maintaining the pilots' effectiveness by reviewing their actions. Furthermore flight physicians are expected to continue their research prior to the flight, during the

flight, and at the conclusion of the flight. With such serious examinations, medical experts are able to maintain effective means of analyzing the productiveness of retraining.[12]

In an unsigned article in Morskoi sbornik in 1981 entitled "Tekhniku v ruki sil'nykh i smelykh" the author relates that a pilot flying from a warship "experiences great physical and emotional strain. Complex factors influence him which also determine the success of carrying out the mission."[13] What then are those elements which contribute to the psychophysical tension of shipboard aviators? Another fundamental question in understanding the psychological problems of deck aviators is to determine if there exists a correlation between their difficulties and those of aviators operating from land-based stations.

One principal difficulty which is common to both shipboard and land-based aviators is the necessity to assimilate the rapid flow of data from the instrument panel. The amount of information which the pilot must evaluate is enormous. Automatic and semi-automatic control systems assist the pilot which must still make the correct assumptions from the available information to correctly operate the craft.[14]

Ivanov notes that the automatic controls are designed to reduce the physical strain on the aviator. Even though there may be a decrease of the overall level of tension, the pilot is responsible for the outcome of the mission. The expanded use of these control systems, besides the psychological benefits derived, will, in Ivanov's estimation, "increase the effectiveness of their labor."[15] To dramatize this viewpoint, Captain V. Oppokov in his article "Vzlet sredi voln," describes the early experience of Sr. Lieutenant A. Belkin, a Forger pilot onboard the Kiev, who, in the

course of retraining, was advised to pay attention to his flight indicators.[16]

Another concern, which is similar to land-based aviation, is the question of the aviator maintaining a proper level of attention and concentration. This is crucial, especially with VTOL type aircraft that takeoff and land vertically. This problem is magnified by the pitch, roll, and list of the ship as well as other variables that complicate the operation of the aircraft. Ivanov is concerned that lieutenants fail to allot the correct level of concentration to the onboard flight control indicators. These mistakes are usually eliminated onshore through constant practice with flight simulators.[17]

The difficulties relating to the pilot's inability to master the onboard control systems have resulted in additional training not only with simulators but also with mock-ups of cabin controls. This issue will be discussed separately later in the chapter, but it appears to have drawn considerable attention from Soviet specialists who believe that its origins can be traced to earlier acquired habits developed during flight training. This must be remedied if the pilot is to master shipboard aircraft.

Fatigue, strain, and tension are always at the center of flight physiology. Shchemelev cites studies which indicate that younger officers should be preferred in retraining since those between 25 and 35 are able to work out training exercises considerably faster than pilots between 36-40. He feels, "Except for that, the effectiveness of retraining at the time of the approach of fatigue, the marked emotional reactions to the flight, depends upon the age of the aviator."[18] Likewise, the retraining process itself contributes to the level of tension which Ivanov believes is "the main psycho-physical element of aviator's contemporary problems."[19]

It appears that other pilots, especially pilot-instructors, are on guard to watch for the tell-tale signs of psychological stress. An example is the case of Belkin, a novice on the Kiev. As he approached his aircraft, he seemed uncertain and his gait appeared awkward. His instructor immediately noted this and quickly reassured him everything would be alright.[20] As a retrainee, Belkin would have his difficulties which resulted in a thorough analysis of pilot retraining and the selection process as a whole.

Shchemelev in his article, "Komu byt' korabel'ym letchikom" examines the relationship between two aviators: one, a certain Lt. B who appears to be A. Belkin, and the other Lt. K. In reviewing K's history it seemed that he lacked the academic brilliance of Lt. B and probably would not have been selected as shipboard aviator except for his excessive motivation to serve on an ASW cruiser. As a result, K mastered the sophisticated techniques of shipboard aviation. What seems to be a general observation of instructors at this point is the inability of trainees to correct their own mistakes, as well as learn from them during retraining. However, this was not the problem of Lt. K. Belkin, or Lt. B, had a serious flaw in his personality, which, Shchemelev indicates, affected his performance. Lt. B, according to the author, was an industrious, persistent, and diligent officer. But it was evident that he demonstrated high levels of anxiety, and was not as fully motivated for flying. Shchemelev assumes that B's "passivity in combination with a decelerated tempo of the psychological processes was the basic reason of the lag of the aviator." This was arrested by the utilization of auto-suggestion and auto-training techniques, and other unidentified special apparatuses which helped mobilize the efforts of the

commander, political workers, doctors, and community elements in an attempt to salvage B's promising career.[21]

However, despite the reliance upon the research of social scientists, it is difficult to forecast the eventual results of retraining. It is impossible to determine which aviator types will master the complexities of shipbcard aircraft quicky and skillfully.[22] It would indicate from Shchemelev's statements that the Soviets are unable to establish precise criteria that will assist them in officer selection.

Soviet specialists, especially Ivanov, are concerned about the apparent low morale of shipboard aviators. The pilots usually inform each other concerning the limitations of the Forger, particularly during landings and take-offs. The effects of the widespread dissemination of the news about the craft's limitations among retrainees results in a category of problems simply classified as "negative influences." This, Ivanov had us believe, is the consequences of faulty perceptions, bad experiences, as well as the general distrust of the aircraft, Ivanov concludes:

> When they started flying them they were confident that the many rumors about its conduct on take-off, in the air, or on landing does not correspond to reality. The craft proved significantly better than what they said about it. However, all this by no means signifies that the factual situation is necessarily simplified, the complexities can clash. Underestimating them as intolerable is also exaggerated.[23]

It is hoped that through a comprehensive utilization of moral-psychological countermeasures that it will diminish the negative influences that result.[24] The objective of retraining is more than the mastery of aircraft techniques, but as an author of an unsigned article in Morskoi sbornik put it, "It is necessary to believe in yourself, in your strength, this is particularly important for us, the young."[25]

Retraining starts on shore with a pilot's familiarization with VTOL aircraft or helicopter. According to Oppokov, "Only after assimulating all of the divisions of the theoretical and practical preparation programs, he enters service on a ship."[26] The Soviets emphasize shore-based training as the foundation of retraining: Major Poluianov notes in his article "Tak molodezh' obrataet Kryl'ia" that it is necessary to develop a sound educational understanding which can only occur first on shore. However, from his estimates, many questions remain which are concerned with the monotonous and inflexibility of the training schedule.[27] But he still feels that pilots must first master the necessary tools onshore before being assigned to ASW cruisers. He notes "this permits a person to be well prepared not only in professional relations, but also no less important, psychologically."[28]

The SNA is concerned about the lead time that results from retraining. It is important to instill the trainees with a thorough mastery of modern flight techniques. The burden of this responsibility, like that of land-based aviation, rests with the commander, political workers, and Komsomol organization. This is more complex than in other military fields, and forces the commander to have a comprehensive understanding of pedagogy, psychology and other practical matters which will facilitate the rate of retraining. This is important, and Ivanov believes that "to overcome a strong, well-equipped enemy, air personnel must have a thorough knowledge, to be decisive, physically healthy, and to be capable of enduring a great burden during the flight to implement every assigned task."[29]

Retraining does not end once a pilot receives his orders to an ASW cruiser since the Forger is considerably complex. Because of the sophistication and complexities of the Forger, a pilot's retraining continues once

he is assigned there. An issue of concern is the ability to acquire the new skills that are necessary to be a competent shipboard aviator. Shchemelev wonders why some pilots are able to master them so quickly and others less so. Goltvenko concludes that "the retraining of experienced specialists always goes much faster."[30]

In retraining, two factors are significant in pilot development. These are constant training and control. What is unique in the latter is that through a systematic, combined process all avenues of training can be utilized to foster pilot development. For example, medical personnel study the aircraft and record the possible effects it will have on the pilot along with the impact of long voyages. Medical specialists are expected to analyze mistakes and to help alter the negative influences that are the by-product of previous flight training. By emphasizing training, it will improve the combat readiness and insure the effectiveness of the aviators. But Poluianov encourages experienced pilot instructors to assist novices with vertical take-offs and landings. This will help them "to acquire the skills necessary in the future."[31]

Since each pilot flies his craft in his own way, it is significant during retraining to study and analyze an individual aviator's particular style which can affect his psychological stability. Colonel-Engineer K. Parkhomenko in his article "Kogda samolet vletaet s paluby" relates that pilots, as well as retrainees, must thoroughly study their craft. This must be done since it can aid pilots when they confront complex situations in the air, such as unexpected weather changes. He claims, "This affects the emotional state of the pilot, especially novices, and can lead to faulty actions." It is much better if the trainee is well acquainted with

the operation of his machine and this can only be accomplished by his professional knowledge.[32]

Flying the Forger or Hormone, Ka-25-helicopter, is a difficult task because of the numerous influences affecting the success of the flight. In the case of the Forger, the aircraft is affected by the air currents and air turbulence that result during take-offs and landings. This is the consequence of engine thrust changes which occur at altitudes of at least two to five meters. The pilot must be aware of this, and the other calculations which enter into the course of mission, for example, gravity, weight, and weather factors. In his book Letchiku o Meteoralogii I. V. Kravchenko lists a number of weather elements which are critical during flight and can adversely affect the success of the mission. These are water spouts, ice rain, rain squalls, sleet and various cloud formations which usually decrease visibility. During retraining the shipboard aviator learns to deal with these conditions by acquiring new skills to accommodate new technology.[33]

Poluianov, emphasizing shipboard aviation, notes, like other Soviet experts, training fundamentals must first take place on shore. As it has been stressed earlier naval aviators are trained in air force schools, but it is not clear whether pilots are immediately sent to either advanced air force academies such as the Kiev Higher Military School or to separate naval facilities to prepare the retrainee for the responsibilities of flying the Forger or Ka-25 Hormone. In this regard, Poluianov believes that in order to feel self-confident in the air, you must "fly well" on the ground. The ultimate success he asserts begins in the classroom before the retrainees reach the fleet. This is particularly evident in the mock air engagements that take place on relatively short notice. Their successes

are attributed to the diligent effort of air commanders and party operatives on shore. An integral aspect of this trend is the role of competition in the retraining process, which will be discussed later.[34]

The retraining of new skills has both a positive and negative impact upon the pilot. This is particularly true in certain operations connected with the Forger. Goltvenko assumes that a large number of errors attributed to the pilot occur just before or after contact with the flight deck.[35] Earlier, it was noted the effects of air current, particularly during the time of the flight, are of grave concern to the pilot and flight instructors. A principal remedy is the constant work with simulators and further control panel orientation.

The instruments of the VTOL are somewhat more complex than other craft. This requires regular training so the pilot can make accurate decisions during the flight. Goltvenko relates that "at times it influences the success of retraining, serves as reasons of typical omissions, such as unintentional starts and stoppages of instruments and assemblies." Besides being employed to correct pilot error in the proper utilization of onboard instruments, the training simulator aids the retrainee in a more difficult function of shipboard aviation -- night flying. It is fortunate that the young officers have at their disposal the work experience of seasoned veterans who assist them to reach a level of mastery.[36]

Poliuanov asserts that the simulator is the most important device in aiding the novice to develop his abilities with the VTOL. The instrument depicts the flight deck on a screen, and that it "allows the younger officer quickly to acquire the durable skills in order to come out of the most complicated situations." However, as Goltvenko notes, some aviators are dissatisfied with them. According to him, they feel that it "does not

create the necessary imitation of the mission in the air." But he stresses that the theory behind the technique is not imitation but modeling, the ability to improve upon the accepted established procedures. The key function of the exercise is to encourage conformity in flight operation in set situations with the use of flight simulators during the retraining processes. However, Poluianov states that training in the cockpit and using simulators is a regular feature onboard the Minsk.[37]

Another significant element that is utilized in retraining is competition. This was particularly acute following the 26th Party Congress.[38] An example of this practice is the "attack method," in which pilots compete directly against each other. In the study made by Goltvenko and Zhitnitskii, they conclude that this practice helps pilots master the skills of piloting a VTOL aircraft. Also it is possible to record the optional growth of skill development and to act as a prophylaxis vis-a-vis the negative influences that were earlier acquired. Poluianov notes that in the course of the exercises, "very often all competitors go nose to nose, wing-tip to wing-tip. All use the desire of quick mastery of complicated techniques to become a genuine master of them." He also believes that competition helps assist the pilot's collective to be combat ready and to be absolutely reliable in the defense of the Soviet Union.[39]

As retraining continues, it places additional stress upon the pilots. Shchemelev assumes that this problem rests with the complexities of the VTOL, which have the characteristics of both an aircraft and a helicopter. Because of the necessity of being continually attuned to the craft's functions during various stages of the flight, the aviator's psycho-physical state apparently changes. The burdens of take-offs and landings are the

most stressful. Earlier acquired skills at this point can possibly hinder the development of the new ones that are essential in piloting a VTOL.[40]

In a similar vein, the Soviets are striving to develop a relationship between the complexity of educational training, such as training flights, and the psychological strain it placed upon the individual. This allows them, as is evident from Shchemelev's account, to determine the prescribed ratio of work to rest as means of improving work efficiency. As a consequence of his findings, Shchemelev believes that the interval between flights should not exceed two hours. Furthermore, he indicates that a reduction of the interval will increase the likelihood of heightened tension and the reduction of pilot performance. His findings indicate recovery between flights comes somewhere between 45 to 60 minutes. Also a prolonged wait on the flight deck can result in a reduction of performance on the aviator's part and an impairment of his psychological abilities. This is considerably different when the pilot is about to begin his task. Shchemelev avers, "However, when the lieutenant began to carry out the assignment at the beginning of the shift his psychological indices were sharply improved."[41]

As it had been indicated earlier, flying the Forger from the deck of a ship requires considerable skill. Those problems, as they have already been enumerated, have the potential of severely taxing the pilot's psychological capabilities and, as was the case with shore-based aviation, physical training is viewed as a potential remedy. But once again some Soviet authorities believe that this should have taken place earlier.[42] But if mistakes do occur, as Poluianov notes concerning the problems of Lieutenant A. Barbar of the Minsk, it is due to the failure of flight training or

preflight preparations. In the case of Barbar, who was experiencing aircraft rotation near the landing deck, he was able only to correct his error through the aid of an experienced pilot.[43]

The Forger requires the pilot or trainee to be constantly vigilant during take-offs and landings. Though the aircraft is equipped with an automatic control system that operates almost independently of the pilot, the most complicated phase is at the low altitudes near the point of landing or take-off. The reason for this is the level of interference or turbulence that occurs as a result of swirling air currents. Another aspect that enters into the pilot's calculation is the roll or list of the ship at the time of landing. Parkhomenko elaborates that at the precise point, the "control apparatus begins to vertically shift that leads to the beginning of the turning movement." A flight instructor told A. Belkin, who serves on the Kiev, that "one will say that on the final approach during landing it is important that you do not look at the water, but at the altimeter. Well, you also still fly to the edge of the command starting point." In Oppokov's article "Vzlet sredi voln," the best advice Belkin received came from Major Yu. Kondratev, possibly his instructor, "You do everything as they taught you." Another problem is precisely estimating the correct speed in the landing approach. The consequence of this error usually is a rough landing, and from Ivanov's perspective, should be rectified on shore during the training course.[44]

In further examining the percentage of flight mistakes, Ivanov, studying the problem within a subunit, concludes that many errors result from previous acquired skills and attempting to apply them to the principles of the VTOL in the course of retraining. According to his estimates, 68 percent of the errors within the unit are subdivided into the following

categories: 32 percent were the outcome of substantial pilot training, 28 percent because of the lack of attention, and 8 percent resulted from the negative influences of previously, acquired skills. He notes that another 8 percent are a direct outgrowth of the preliminary flight preparations. Another aspect which Shchemelev earlier addressed was the ratio between work and rest and its impact upon flight performance. Goltvenko believes that prolonged periods away from flying can possibly result in mistakes in the course of the flight.[45]

Another important aspect of shipboard aviation is the training and use of helicopters at sea. The mission of helicopters is principally in their ASW role. From the available sources it is clearly evident that the education and training of both pilots and crews closely follows the general pattern of other shipboard aviators. Major Iu. Ososkov, a navigator-expert, notes, "The special study of flying skills of anti-submariners is fundamental. In the process its crew acquires the knowledge, the firm skills of using the techniques and weapons, the ability to make a valid decision, to adjust in a modern battle, and to successfully struggle with the forces of the enemy." In training and during regular flights, pilots of helicopters operate at night and in all types of weather conditions. As a consequence this places special demands upon the pilot's stamina. Thus training is designed to have the pilot operate in unfavorable conditions "to ascend from the deck of a ship, to check the assigned area of the sea or ocean, to detect the underwater objective and to conduct a precise strike upon it."[46]

An important phase of helicopter training is spent in ASW functions directly related to hydroacoustics. The goal is the ability to tract submarines immediately after contact. It should be noted that this phase

of helicopter training is just another element, though an important one, of the general preparation of pilots. Aviators are expected to react quickly to the sudden alterations in the mission as well as insuring an understanding of the flight instruments and the available weapons systems. Ososkov describes the education techniques of Majors G. Pravdistev and V. Molokanov in preparing trainees. They first inform the pilots of the typical operations of a submarine on a long voyage. The simulation then is arranged to duplicate the acoustic signature of the submarine which is received by an hydroacoustic buoy. The instructors develop a realistic scenario in which the trainees must function. This includes hearing the noises of the submarine and being prepared for the submarine's evasions. They must also make the appropriate discussions in the context of the assignment. Ososkov recommends this type of combat training which closely parallels actual anti-submarine operations and notes, "If this requirement is not adhered to, specialists can lose their skills."[47]

The instructor plays a crucial role in the training process of helicopter pilots. His mission, as seen in the above, is to create realistic exercises that will aid the novice to master the technologies available in anti-submarine operations. He also analyzes, as was the case with land-based aviation, the actions of pilots and crews, particularly their mistakes. Faulty training can result in the failure of future ASW missions, Ososkov notes, when he relates a training search where the pilot and crew lost the submarine but were able to restore contact. The evaluator, despite the constant efforts of the trainees, was still dissatisfied with their performance. He concludes with the warning, "In real situations minute failures can reverse the verdict of the mission." Another concern is the faulty equipment and simulators that are supplied by Soviet industry

to the navy. If this persists, it can affect training and the trainee's performance in battle.[48]

Take-off and landing on the deck of a ship, while it is rolling in heavy seas, is a serious problem which affects not only Forger pilots but also pilots of helicopters. The air turbulence and the roll of the ship forces the pilot to pay close attention to his instruments and to concentrate on his actions at take-off. As a consequence, the resulting strain can overwhelm the aviator and lead to accidents. Such incidents are especially acute over water surfaces and contribute to considerable levels of physical and psychological tension. Slavin enumerates a series of factors which contribute to this phenomenon in helicopter pilots. According to his research, "loneliness, a monotonous unfamiliar location, increasing eye strain, possible complications of the flight and a forced landing in the water" have an adverse effect on airmen. This is further influenced by the illusionary effects of waves often producing a shift in the craft. The necessity to rely upon visual estimates also complicates the problem. The most difficult assignments are, however, night flights. Even with the aid of flares, or other forms of night illumination, there is still insufficient lighting in the area of operations. Slavin believes that in such eventualities the educational military missions should be decided by the crew's most experienced, who have systematically flown in complicated situations.[49]

What then is the future of Soviet shipboard aviation? What course will the Soviets follow in the expansion of their shipboard air forces? These questions and a number of others are of pressing concern to Western analysts who are mesmerized by, and often exaggerate, the Soviet threat in order to justify another expensive weapon system. From the available

sources, one finds that although shipboard aviation is more extensive than land-based aviation, the general training pattern follow similar lines. It is also clear that shipboard aviators are trained on VTOL aircraft before they reach the fleet. Morale is a serious issue and is closely related to the pilot's awareness concerning the limitations of the Forger. It is also evident that the YAK-36 is a short term answer to the Soviets' needs in air cover and will be replaced possibly by a superior VTOL which may resemble the British Sea Harrier or even a true Soviet CTOL carrier. This will require continued emphasis upon training and a thorough understanding of the psycho-physical capabilities of their pilots.

NOTES

[1]Cross, p. 91.

[2]Defense Intelligence Agency, Soviet Military Schools, June, 1978.

[3]N. Shchemelev, "Komu byt' korabel'nym letchikom," Morskoi sbornik, No. 9, September, 1981, p. 46.

[4]Ibid., p. 43.

[5]Ibid., p. 46.

[6]Ibid., p. 47.

[7]B. Fedorovskii, "Mnogie zavisit i ot Komandira-instruktora," Morskoi sbornik, No. 1, January, 1982, p. 55.

[8]P. Ivanov and V. Nemchenko, "Letchik pereuchivaetsia," Morskoi sbornik, No. 1, January, 1981, p. 46.

[9]A. Goltvenko and A. Zhitnitskii, "Letchik priobrataet navyki," Morskoi sbornik, No. 4, April, 1983, pp. 48-49.

[10]Ibid., p. 50.

[11]Shchemelev, pp. 45-46.

[12]Ibid., p. 46; Goltvenko, p. 51.

[13]"Tekhniku--v ruke silnylch i smelykh," Morskoi sbornik, No. 11, November, 1981, p. 58.

[14]Ivanov, p. 45.

[15]Ibid.

[16]A. Oppokov, "Vzlet sredi voln," Morskoi sbornik, No. 1, January, 1983, p. 63.

[17]Ivanov, p. 46; Goltvenko, p. 48.

[18]Shchemelev, pp. 42-43.

[19]Ivanov, p. 46.

[20]Oppokov, p. 61.

[21]Shchemelev, p. 43.

[22]Ibid.

[23]Ivanov, p. 45.

[24]P. Slavin, "Pilotirovanie Korabel'nykh vertoletov," Morskoi sbornik, No. 12, December, 1979, p. 40.

[25]"Adres aerodroma-okean," Morskoi sbornik, No. 11, November, 1981, p. 53.

[26]Oppokov, p. 61.

[27]V. Poluianov, "Tak molodezh' obrataet Kryl'ia," Morskoi sbornik, No. 4, April, 1982, p. 54.

[28]Ibid., p. 53.

[29]Ivanov, p. 43.

[30]Shchemelev, pp. 42-43; Goltvenko, p. 49.

[31]Goltvenko, p. 51; Poluianov, pp. 52-53.

[32]Ivanov, p. 43; K. Parkhomenko, "Kogda samulet vzletaet s paluby," Morskoi sbornik, No. 5, May, 1982, p. 52.

[33]Parkhomenko, pp. 52-53; Ivanov, p. 43; I. V. Kravchenko; Letchiku o Meteorologvi (Moskva: Voenizdat, 1982), p. 159.

[34]Poluianov, p. 54.

[35]Goltvenko, p. 50.

[36]Ibid.

[37]Poluianov, p. 54; Goltvenko, p. 50.

[38]Poluianov, p. 52.

[39]Goltvenko, p. 48; Poluianov, p. 54.

[40]Shchemelev, p. 42.

[41]Ibid., pp. 45-46.

[42]Poluianov, p. 52.

[43]Ibid., p. 54.

[44]Oppokov, pp. 62-63; Parkhomenko, p. 53; Ivanov, p. 46.

[45]Ivanov, p. 46; Goltvenko, p. 48.

[46]Iu Ososkov, "Uchebnaia baza i masterstvo aviatorov," Morskoi sbornik, No. 6, May, 1978, p. 53.

[47]Ibid., pp. 55-56.

[48]Ibid., p. 56.

[49]Slavin, pp. 39-40.

CHAPTER FIVE

REFLECTIONS

Writing in 1970, Siegfried Breyer noted that the first aircraft platforms the Soviets would design would be plagued by a series of problems that only experience and future vessels could resolve. According to his calculations within a span of 13 years they would have "a few operational carriers." However, he assumed that even then "Such a development period would make it impossible for the Soviets to overtake the enormous lead that the NATO fleets have not only in numbers of aircraft carriers but, even more important, in operational efficiency."[1] How then have the Soviets fared since Breyer's observations?

Since then the Soviets have built and put into operation two classes of ASW cruisers and have commenced the construction of a possible genuine CTOL carrier. Likewise, the Soviets have had the opportunity to observe V/STOL aircraft in operation during actual combat conditions and were able to evaluate their performance. Their conclusions in light of the events in the South Atlantic, seem to indicate that they are headed in the right direction. It is then possible to make inferences from their commentary on the Falklands War to possible future trends in Soviet carrier development. Such possibilities include research and development in a second generation V/STOL aircraft, the incorporation on the new carrier of CTOL air superiority fighters and VSTOLs, as well as early warning electronic aircraft that will provide additional security for Soviet vessels and carrier platforms.

These assumptions, and a few others, were evident in a series of articles outlining the course of the Falklands Conflict in Morskoi sbornik. Captains B. Rodinov and N. Novichkov stress that in most air engagements

between the British and Argentine Sky Hawks, Mirages, and Daggers the "advantage was on the side of the vertical flight aircraft." They remind their readers that this should come as no great surprise, since in 1973 the U.S. Navy conducted tests to select a new interceptor, and the Harrier held its own vis-a-vis the F-14 Tomcat. But what made the Sea Harrier, V/STOL aircraft, so appealing to the authors was its "VIFFING" (vectoring in forward flight) capability, which was able to neutralize "the obsolete" anti-aircraft missiles of the Argentines, and effectively negate the Argentines' numerical superiority in the air.[2]

Despite the advantage of the Argentines, the British were able to inflict considerable damage upon their foe who maintained approximately a 3:1 margin over the British in combat aircraft, and an even greater advantage of 7:1 over their English adversaries before reinforcements arrived. However, what intrigued the Soviet authorities, especially Vice Admiral Uskov, was the ability of the English to deploy both Harriers and Sea Harriers without the aid of aircraft carriers. This was accomplished by the extensive use of container ships, which greatly improved the flexibility of the British fleet to protect their second and third echelons and keep their aircraft carriers, the Hermes and the Invincible, outside the range of Argentina attack aircraft.[3] Another function of the British naval air arm which did not escape the attention of the Soviets was the utilization of deck aviation in close air-ground support during amphibious landings. Uskov stresses that, "During this [the amphibious operation] deck aviation must not only prepare PVO of surface ships, but also for actions against ground objectives." A pivotal weakness, which did not escape Uskov's eye, was the lack of early warning aircraft. Uskov feels this was "the reason for the great loss of warships and merchant vessels," and is

crucial to the Soviets in their own aircraft carrier program, since they too lack similar planes in their inventory.[4]

Another lesson that the Soviets discovered as a consequence of the Falklands Conflict is the importance of their anti-missile defense complexes. It was this failure, particularly in the design of the Sheffield class destroyers, that concerned the Soviets. Rodionov and Novichkov state that the weakness of this type of warship and the limitations of its anti-missile defenses made it especially defenseless to air attack. They conclude, "These factors side by side with the important departure from the fundamental strength of the carrier task forces made the picket ships vulnerable to air attacks and essentially influenced the military tactics of Argentine aviation."[5]

What is the significance of these Soviet observations? The most important aspect of this problem is the response of U.S. naval policy makers to those statements. Even before the Falklands War, the U.S. Navy's position concerning V/STOL aircraft had been decided. The present Secretary of the Navy, John Lehman, a defense analyst in his own right, has taken a rather dim view of the potential of V/STOLs. In the 1970's, the Marine Corps, believing that they needed an aircraft that could support their infantry formations and not be totally dependent upon large attack carriers made the decision to purchase the Harrier AV8B to fill that mission. The Marines hoped that they would be able to equip all their squadrons with the Harrier by the mid-1980's. However, in 1978, Lehman, in the role as an analyst and naval aviator, claimed despite the V/STOL's ability "to vector its thrust nozzles to achieve extraordinary turn rates and decelerations" making the Harrier "a formidable dog-fight," it has serious

limitations. He stated that "because of their very limited range and payload, even when operating with a long deck run which about doubles range/payload, they simply were not competitive with conventional aircraft."[6]

Lehman's arguments are scathing, and he seems to dismiss any immediate or potential utility of V/STOL technology. He asserts that "high performance V/STOL aircraft will have substantially inferior performance to those conventional aircraft of contemporary technology that get their launch energy by conventional means." In examining the future of V/STOL aircraft he claims that "Upon surveying the future prospects and promise of V/STOL, one conclusion is that there may be less here than meets the eye."[7] Rodionov and Novichkov in "Taktika deistvii aviatsii protiv korablei" disagree -- it would be interesting to compare their evaluation with those of the U.S.M.C. and the Royal Navy.

Unfortunately, many U.S analysts who comment on the Falklands War have missed the mark when it comes to the lessons to be drawn from the conflict. They tend to imply that the United States must (1) increase the size of the navy; (2) be more resolute in world affairs; (3) understand that large ships can no longer be "adequately" defended; (4) reexamine its commitment to a large battle fleet; and (5) divert its energies to build numerous smaller vessels, each with the capability of handling a small number of V/STOL aircraft.[8]

American authorities tend to stress that the fate of the HMS Sheffield could not happen to an American warship. John Lehman echoed such an assumption when he claimed that "if an American ship had been the target of the Argentine attack, it would not have gotten anywhere near kill range."[9] Unfortunately, in the "fog" of battle anything can happen, especially when

the adversary is a more sophisticated foe than Argentina and can hurl considerably more ordnance at a carrier task force than a meagre six Exocet ASMS. A very disheartening aspect in most of the literature is the continual downgrading of the achievements of the Harrier. Time, no doubt, expressed the general misunderstanding with its opinion that "Britain's Sea Harrier, a vertical/short-takeoff and landing (V/STOL) attack plane, is earning high praise for its maneuverability. The plane can stop in mid-air, turn on a dime and leap straight upward to dodge an oncoming enemy missile. The Harrier's speed (736 m.p.h.) makes it unsuitable for extended fleet protection and vulnerable missiles."[10] Such views fail to comprehend the ability of extending the number of sea based air platforms by utilizing container ships as the British did during the course of the war. A use of V/STOLs in this way, as a cover for picket ships and task groups can greatly increase the protection, and with the aid of early warning systems help to reduce the threat of low flying ASMs. Joining with land-based or carrier based reconn-electronic warfare aircraft, these V/STOL task groups can supplement conventional carrier forces and operate in environments where prudent naval officers would be reluctant to risk costly and scarce attack carrier groups.

The Soviet assessment of the lessons of the Falklands War raises the question of whether they can correct the existing deficiencies in training and technology and emerge as a first rate shipboard aviation power. Because of the rigidity of the system, the desire to mirror U.S. and other NATO weapons systems, the inability to master the complex technologies of modern shipboard aircraft, such as the V/STOL, the answer would appear to be negative.

In spite of the numerous articles on the subject of training in Morskoi sbornik, they all share in common the process of imitation through modelling. Pilot initiative is hardly ever mentioned in the context of the standard Western understanding of the concept, except when the Soviets encourage pilots to master unexpected situations in relation to approved modelling scenarios. Medical service personnel utilize the principles of naval and military psychology to assist in ascertaining the psycho-physical effects of flight and analyzing the reasons for pilot error. They function as a significant pillar in the training process. The reliance on flight simulators and other similar apparatuses would indicate that actual flying time is reduced proportionally. If this is the case, it can help explain the problem of diminished pilot performance, particularly with the Forger, which requires constant and consistent practice in the air. A final weakness, one which should never be underestimated, is that Soviet deck aviation still remains the handmaiden of its land-based older brother. Onboard training closely parallels the same training schemes as land-based air, and until the Soviets complete their large carriers, the situation will be substantially the same.

In spite of the failures in training and the limitations in Soviet technology, the Soviets have hit upon an original approach to shipboard aviation -- the V/STOL, even though their Forger seems unable to conduct short take-offs. If they manage to develop a craft capable of functioning like a Harrier II, and a training schedule which emphasizes pilot initiative with increased flying time, they could present a serious challenge in the future. This appears unlikely.

It is wise to return to Breyer's original supposition concerning Soviet carrier development. Though after 13 years Breyer was fundamentally

correct, the Kiev class platforms and helicopter cruisers of the Moskva class are totally inadequate in "Operational efficiency" and design. The gap between the Soviet navy and its NATO adversaries is steadily widening in carrier technology, and even though the Soviet carrier program is a reflection of their overall tactical requirements, much of the valuable experiences they may have learned from their earlier platforms (and the Falklands Conflict) will lose its value if they disregard the V/STOL and abandon it altogether to move into the area of conventional attack carriers. If the Soviets choose the Mig 27 Flogger, training and retraining of pilots would have to be reorganized, thus temporarily reducing the carrier's operational effectiveness.

An alternative prognostication might be that the next generation of Soviet aviation platforms will be a large Hermes class carrier with additional complements of Forgers or second generation V/STOLs, or perhaps a combination of both. If that is the case, the Kiev class ASW cruiser will not be wasted and can be effectively integrated with CTOL platforms. A deviation from this position is that the Soviets may design a CTOL CV and utilize the Kiev class ASW cruisers as a large carrier task force to gain control of the sea and air over a given naval zone, such as the Iceland-Greenland-U.K. gap, for a specific and set time to allow their submarine assets to get to open water and on the NATO supply routes. This concept is certainly plausible in light of Admiral Gorshkov's earlier writings and his view of the German failure to exploit combined actions among submarines, surface ships, and aviation units during World War II. Any operation on a scale such as this would have to include land-based naval air forces, particularly the Backfire bombers in an anti-ship role. In connection with this assumption, the development of large carrier task groups with Kiev

class carriers on the periphery could not only supply additional air cover, but assist in close air ground support during naval landing operations. In addition, the flexibility of this approach permits the Soviets, according to John Erickson, in summarizing early Gorshkov arguments to exercise "power and presence below the strategic-nuclear level."[11] The lessons of the Falklands War point to the correctness of Vice Admiral Stalbo's view of "operational deployment," the ability to implement those tasks that are necessary on an operational level.[12] It would appear that the use of the Kiev class ASW carriers in such configurations would add credence to that argument, especially when Admiral I. Kapitanets notes that the navy must gain control of the sea and the air to implement its missions, thus insuring a successful resolution of the struggle, as evidence in the Falklands Conflict.[13]

Despite the failures in training and the limitations of Soviet technology, the Soviets have hit upon a unique concept for shipboard aviation. Even though their VTOL is less sophisticated than the Harrier and is unable to conduct short take-offs, its mission fits the need to protect their helicopters and provide air cover for the navy's surface assets. But if they manage to develop a V/STOL similar to the Harrier II, and revolutionize their training program to emphasize pilot initiative, they would present a more serious challenge to the U.S. and NATO forces. In spite of all the apparent shortcomings, including the willingness to sacrafice quality for quantity in aircraft production, the human factor, the historic courage, boldness, and elan of Soviet naval aviators should not be discounted, if, and when, conflict should ever occur.

NOTES

[1]Siegfried Breyer, Guide to the Soviet Navy (Annapolis, Maryland: U.S. Naval Institute Press, 1970, pp. 192-193.

[2]B. Rodionov and N. Novichkov, "Tak'tnka deistvii aviatsii protiv Korablei," Morskoi sbornik, December, 1982, No. 12, pp. 86-87.

[3]I. Uskov, "Uroki anglo-argentinskogo Konflikta i rol'nadvodnykh Korablei v bor'be na more," Morskoi sbornik, November, 1982, No. 11, p. 88; Ridionov, p. 81.

[4]Ibid., pp. 90-91.

[5]Rodionov, p. 84.

[6]John Lehman, "Aircraft Carriers: The Real Choices," The Washington Papers, VI, 52 Beverly Hills and London: Sage Publ., 1978, p. 72.

[7]Ibid., p. 77.

[8]Stansfield Turner, "The Unobvious Lessons of the Falklands War," Proceedings, 109/4, April, 1983, pp. 50-57; Paul F. Walker, "Smart Weapons in Naval Warfare," Scientific American, 248, 5, May, 1983, pp. 53-61; "Battle of the Microchips," Time, May 17, 1982, p. 26.

[9]Walker, p. 57.

[10]"Battle of Microchips," Time, May 17, 1982, p. 26.

[11]John Erickson, "Soviet Defense Policies and Naval Interests," Soviet Naval Policy: Objectives and Constraints, Michael MccGwire, Ken Booth, and John McDonnell, eds. (New York: Praeger, 1975), p. 61.

[12]Uskov, p. 87.

[13]I. Kapitanets, "Rol' flota v Anglo-Argentinskom, Konflikte," Morskoi sbornik, No. 2, February, 1983, p. 14.

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