

FINNISH AIR FORCE DOCTRINE – RESHAPING FOR THE 21ST CENTURY

LtCol Janne Pauni

1. Introduction

Thinking about strategies and doctrines is somehow odd for a fighter pilot – more commonly he spends all his brain capacity on safe and familiar subjects like tactics, dogfighting and weapon systems. Still, the doctrine lies behind all activities of the armed forces, guiding their training, equipping and even their fighting spirit.

This writing is a drastically modified version of a research report submitted to the faculty of the United States Air Force University Air War College. The author was honored to represent the Finnish Air Force as a member of the class of 1996 of this highest USAF service school. The paper has two purposes. Firstly, it gives an overview of the doctrinal development both internationally and in Finland. Secondly, it tries to build the basic frame upon which the Finnish Air Force can construct a reshaped air force doctrine. The thesis of the research was: the Finnish Air Force needs a realistic and up-to-date doctrine that gives the military leaders and other air force personnel defined fundamental principles by which they guide their actions. The hypothesis was that the current doctrine needs reshaping to meet the challenges of the next century.

This paper includes the following parts: the fundamentals, the development of doctrines, the challenges and options, and finally the reshaping of the Finnish Air Force doctrine. The definitions, knowledge on development of air power theories and doctrines, and their implementation are all needed to construct new theories and doctrines.

2. Fundamentals of Doctrines

It is useless to examine air force doctrines, unless one do not define the involving words and make their meaning clear. The roots of the term doctrine are in the archaic Creek language. There it means teaching or instruction. To western languages the word has transferred from the Latin doctrina. In modern language doctrine means “something taught; teaching”. Doctrine may indicate a formulated theory supported or not controverted by evidence, backed or sanctioned by authority, and proposed for acceptance. It may refer to authoritative teaching accepted by a body of believers or adherents. Formally understood, doctrines in-

clude general views we can use when analyzing certain questions or situations, and when giving guidelines to action in the future situations.

The former Chief of Staff of the USAF, General Curtis E. LeMay stated that "At the very heart of war lies doctrine. It represents the central belief for waging war in order to achieve victory... It is building material for strategy. It is fundamental to sound judgement." Air force doctrine is a military doctrine that applies the employment and operations of air power. Instead of having any internationally accepted formal definitions, armed forces have defined the military doctrine in several ways. Every composer has wanted a definition that suits best for his purpose. The meaning of the term has also developed during years. A very good common definition is: "Military doctrine is what the military believes about the best way to conduct their affairs"¹ In the armed forces doctrine is viewed in terms of strategy, operational art, and tactics. It is the basis for both academic training and field exercises, and in the forecast of the future activities and events. Its most critical military application is, how forces will fight in combat operations.

In the United States and NATO countries the valid military dictionaries define the term: "Doctrine – Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application."² The previous definition is suitable to various levels of war, to different countries, and to different services. Hence, it suits well to the Finnish Air Force. According to this definition, the Finnish Air Force doctrine means those central principles, by which the Air Force or part of it guides actions to meet objectives.

The function of military doctrine is to provide direction as an aid to understanding. A military doctrine is not a dogma, it is not mandatory. It represents advice on the best way collectively and officially accepted to employ military forces. We base it on experience and lessons learned.³

Doctrines are adapted at several levels. We need a higher level doctrine and functional level doctrines. The higher level doctrine, often called as the fundamental doctrine, can be a national security or military doctrine. Environmental doctrines, organizational doctrines and cooperation doctrines (joint doctrine and combined doctrine) are all functional.

Land, sea and air power have distinct and specific characteristics, and different application. All three main services need their own doctrines. In Finland, only the Air Force has used a written doctrine document. The other services have various training manuals.

The principles of land, sea, and air(space) warfare can be published in an environmental or organizational doctrine. The environmental doctrine may be needed, if for example several services participate strongly in the air war. Typically, air forces write only combined environmental-organizational doctrines.

Air force doctrines have some typical features. They are narrower in scope than fundamental doctrines because they deal with the exercise of military power in a particular medium.

The doctrine covers the full spectrum of conflict and it can be written at three

levels: strategic, operational, and tactical. According to the Royal Air Force, strategic doctrine states the most fundamental and enduring principles, thus building the foundation of air power doctrine. It establishes the framework and foundation for the effective use of air power. In the United States, the Air Force Basic Aerospace Doctrine “establishes fundamental principles that describe and guide the proper use of aerospace forces in war. Basic doctrine, the foundation of all aerospace doctrine, provides broad, enduring guidance which should be used when deciding how Air Force forces should be organized, trained, equipped, employed, and sustained. Basic doctrine is the cornerstone and provides the framework from which the Air Force develops operational and tactical doctrine”.⁴

In the RAF operational doctrine applies the principles of strategic doctrine into military actions by describing the proper use of air power in the context of distinct objectives, force capabilities, broad mission areas, and operational environment. In the USAF it establishes principles that guide the use of air and space forces in campaigns and major operations. It examines relationship among objectives, forces, environments and actions to ensure that operations contribute to achieving assigned objectives.

Tactical doctrine applies strategic and operational doctrine to military actions by describing the proper use of specific weapon systems, and other types of systems, to accomplish detailed objectives. It deals with the execution of roles and tasks (RAF), and establishes detailed tactics, techniques, and procedures guiding the use of specific weapon systems to accomplish specific objectives in engagements and battles (USAF).

Strategic, operational and tactical doctrines are not mutually exclusive nor rigidly limited. They connect to each other. Joint and combined doctrines describe the best way to organize, integrate and employ air power in joint and combined operations.

It is important to define the relation between doctrine, strategy, and tactics. Doctrine gives guidance offering several alternative strategies and tactics. Strategy and tactics mean certain actions in certain situations. On the other hand, successfully employed strategy or tactics can and also sometimes should lead to development of the doctrine.

Why do we need doctrines? What are the benefits of doctrines, and what problems would the lack of a doctrine cause? Military organizations and the nature of military operations relate to a group, rather than individual activities. It is essential to operate as a team. Thus, the formal use of doctrine “this is the way we do it” is an absolute military requirement. A doctrine gives at common starting point, language, and purpose, and it combines the actions of different units to a whole.

Doctrines have many purposes. They provide analysis of experience, and a determination of beliefs. They also teach those beliefs to new generations. Their third mission is to generate a common base for knowledge on which we can base our strategic decisions. We do not need to reinvent things, and make the old mistakes again. A good doctrine is a storehouse of analyzed experience and military wisdom that can be a strategist’s guide in decision making. We connect doctrines

with strategic, operational and tactical plans and orders. For different echelons and units, doctrine gives the basic contents which they reshape to procedures and methods to be used in varying situations.

The missing of a doctrine causes problems at all levels. Without a doctrine, it is more difficult to define a national military strategy, and procure economical resources for the armed forces. By using the doctrine, military leaders can support and teach political decision makers and make their work easier. When having a well argued doctrine air forces can show that they are needed, and they can have an influence when the resources are dealt. At strategic, operational, and tactical level the lack or weaknesses of doctrine causes confusion and uncertainties of intentions, purposes, procedures, and methods. Efficiency declines. The lack of doctrine causes also difficulties in teaching.

Doctrinal development is a continuous process involving a circular methodology. The inputs involved in this process are: national interests, military objectives, threat, policy, experience, theories about employment of the air force, and capabilities. We need to consider these inputs and process them into the various levels of the doctrine. By analyzing the outputs, we formulate the doctrine. Later on, we can translate the doctrine into actual military capabilities through plans, acquisitions, organizations, force structuring, and training requirements. We create actual military capabilities within the guidelines provided by the doctrine, test these capabilities through experience, and refine the doctrine by using feedback from the results of those tests. The last element in doctrinal process is validation. It ensures that the doctrine is sound and avoids producing inappropriate organizations and force structures. Experience, obtained by results of combat or from the outcome of training, is the key element.

3. HISTORICAL DEVELOPMENT

3.1 Main Phases in Doctrine Development

The study of the doctrinal development is useful: we become familiar with the theories and doctrines of airpower, and understand their importance. During this study we need a wide angle of view: the doctrines, strategy, operational art, and tactics have to be seen as a whole.

Air forces have developed their doctrines throughout their existence. Larger aviation nations like France, Germany, the United Kingdom, the United States, and Russia have gathered experience by employing air power in various roles and missions. They have developed air force or air power doctrines by using history, theories, capabilities, military strategy, and technical development in military aviation. Also the Finnish Air Force has tried to follow some international developments with or sometimes also without success.

The doctrinal development can be defined in three main periods: the birth of doctrines after W.W.I, the employment of doctrines during W.W.II and the doc-

trinal development after W.W.II. The basic air power theories and doctrines were created before W.W.II. In this war they were put into experiment and refined. The post-W.W. II era including the Cold War and conflicts like Korea, Vietnam, and the Gulf War, has offered many possibilities to rethink and refine the doctrines.

3.2 Birth of Air Force Doctrines

Employment of air power reached a high level in W.W.I. Its main role was to support the army. The main mission was reconnaissance, and during the war close air support and air interdiction developed. However control of the air got great attention in publicity. Success in the battle shifted from side to side according to improvements in aircraft and engine technology.

At the end of the war both sides had used their aircraft in strategic attack. This had great importance for the birth of air power doctrines in the years following the war. In W.W.I land warfare developed to an unending attrition war. Theoreticians of warfare tried to find more effective ways to win the war. Among new theories, theory of strategic air war was born. Its main creators were Italian General Giulio Douhet and British Lord Hugh Trenchard.⁵

The core of Douhet's theory is reasonably simple. He believed the defense in land warfare had obtained permanent ascendancy over the offensive. In the air the situation was opposite. According to Douhet, aircraft are more effective when used offensively. Douhet thought aircraft were unsuitable to defense as they had insufficient endurance to remain over a potential target area long enough to make interception likely. The defender should disperse his fighters among a number of potential targets, but the attacker would be free to mass his aircraft from several bases against one target. The attacker could therefore attain local superiority. Douhet assumed bombers could penetrate any air defense. Monopoly of air operations would finally expose the enemy's population and industry to further air attack. The people of a country which had lost command of the air would, under the strain of constant aerial bombardment, soon lose their will to fight and force their government to capitulate. In Douhet's theory the only defense against air attacks were pre-emptive air attacks.⁶ This theory influenced the doctrinal development in many countries, and roots of the strategic air attack grow in the air services of both the United Kingdom and the United States.

In England Lord Trenchard had developed likely thoughts already earlier. Strategic air war was a suitable role for the independent Royal Air Force. Strategic air attacks could be brought against enemies from the island fortress. In the 1920s the most probable enemy was France. Although air attack was the ruling role, the greater London was surrounded by a weak defense zone. In the 1920s and early 1930s political unwillingness and scarce resources prevented development of doctrine and aircraft. Equipped with a narrowly adequate number of fighter planes and the radar, the Air Defence of Great Britain (ADGB) was ready for defense when the Battle of Britain started. Although the importance of strategic attack

was emphasized, the British bomber force was not strong enough for a campaign against Germany before the year 1942.⁷

In the United States Brigadier General William "Billy" Mitchell, followed by the teachers of the Air Corps Tactical School (ACTS), started the process that led to the strategic bombing doctrine used in W.W.II. From Douhet's theory they picked the thought of direct air attacks against other than military targets. Mitchell added the idea to control important centers of the enemy to achieve the victory. ACTS developed the doctrine, and picked the industrial capacity of the enemy as a central target. The developers of the doctrine believed that air power alone was enough to win wars. Bombing key targets in industrial net would destroy both the enemy's capability to fight, and his morale.⁸ The daylight high level precision bombing was the method developed to fulfill this doctrine. In the 1930s the United States did not need a strong air defense system. The common belief was that the strategic bombers could survive without escort fighters. Aircraft acquirers emphasized bomber planes, and as a result the air force got the B-17s. In the United States the doctrine of strategic air attack served also well the Air Corps struggle to part from the Army and get the status of an independent service.

In Germany, the experience gathered in W.W.I was analyzed and taken into the employment principles and doctrines immediately after the war. In 1921 General Hans von Seeckt stated, that the enemy should be driven to defense, and his force and attack capability should be broken by destroying a great number of aircraft. Germany neither adapted the doctrine of strategic air attack nor built enough aircraft for a strategic bombing campaign. The strong development of the Luftwaffe began in 1933. The first Chief of Staff, General Walter Wevel stressed actions against enemy air force. He supported construction of strategic bomber aircraft.⁹ After the rebirth, the Luftwaffe published its first doctrine *Luftkriegführung*, air warfare, in 1935. The main roles and missions of the Luftwaffe were: control of the air, cooperation with the army and navy, air attacks against the enemy resources, and battlefield air interdiction. Cooperation between the services was important.¹⁰ The doctrine, methods and procedures, and aircraft of the Luftwaffe were well suitable for support of the army. Besides that the character of the doctrine was offensive, also the counter air mission was almost only offensive in nature.

The Soviet Union built a strong air force in the 1930s. The requirements for development came from the army. In Tuchachevski's attack doctrine, the Red Air Force was tied to the army. Its role was tactical support. Mixed air divisions built up from fighters, bombers and reconnaissance aircraft were created, and their mission was to give support to individual army divisions near the front. Even the long-range bomber aircraft were split up between army groups for use on mainly tactical missions. Although strong in numbers, the Red Air Force was ill trained. The weaknesses appeared in the Russian-Finnish Winter War in 1939-40, and in the beginning phase of the Operation Barbarossa in 1941. The Russian air defense was also weak. It was mainly based on anti-aircraft weapons.¹¹

In the 1930s also the French Air Force was integrated in small army units. It

expressed need for greater independence and operational flexibility. In 1933 it won the battle for constitutional independence from the army, but the unity of command remained. Aircraft were to be used like tanks, in close support to the ground units.¹²

In the eve of W.W.II three types of doctrines existed: the United States emphasized strategic air attack, France, Russia and Germany stressed support to the army, and Great Britain had a mixed doctrine concentrating on both air defense and air attack.

3.3 Roots of the Finnish Air Force Doctrine

The Finnish Air Force was founded in the spring of 1918 when the air force received its first aircraft. The Finnish Air Force became an independent service in the armed forces. In the Finnish War of Independence both sides flew aircraft. During the war, air force acquired more aircraft and pilots. Also the doctrinal development began.¹³

In 1918 the Finnish officers had only a little experience and knowledge about air warfare, and they needed assistance. The first country to give guidance was Germany. The role of the German officers was decisive in the development. Their opinion was that seaplanes are more suitable to Finland's environment than land based planes. This belief became common in the following years.

The first Finnish defense plans were offensive including an offensive against St. Petersburg. Practical needs, more than theories, decided the development of the Air Force. In 1918-19 Finnish pilots took part in protecting the unstable Eastern border area. Air reconnaissance was relatively effective, and helped to follow the developments in Russia.

When the Germans had to leave Finland, a small group of French officers continued their unfinished work in the spring of 1919. They made a plan to equip the Air Force with French aircraft, and stated that the role of the Air Force was offensive reconnaissance, meaning observation of the enemy behind the lines, and bombing and strafing the most important targets. The French supported land based aircraft, which led to a disagreement, and they had to leave in the spring of 1920. For later development most important was the education and training of Finnish officers in France.

The first years of the Finnish Air Force included drafting the employment principles – a doctrine. The Chief of Staff of the Air Force argued the importance of air power in April 1919. He thought the Air Force was a service for cooperation with the army and navy. The missions were: reconnaissance, protection of the nation against enemy reconnaissance and air attacks, taking part in the infantry fight (close air support), air attacks on enemy areas, and communication. Cooperation with the navy included sea reconnaissance, air mining, and air attacks against enemy submarines and battleships.

In 1919 the wartime missions of the Air Force were in cooperation with the other services: air reconnaissance, area surveillance, attacks and bombing, main-

taining communication, artillery spotting and air combat (pursuit). To conduct area surveillance, air superiority over the battlefield was needed. Air attacks were recommended against targets unreachable by artillery fire, and strafing enemy troops would have a morale weakening effect. Air combat meant preventing enemy activities, making other air force missions possible, and ruining the enemy's capability to fly by destroying his pilots and planes. This first official doctrinal mission definition of the Air Force gave it a role of an assisting service. There was only very little weight on the independent role, and the doctrine was like a copy from the beginning of the W.W.I, when the development of bomber aircraft was still slow, and the fighter mission was not yet needed.

The development of the Air Force doctrine continued in the early years of the 1920s. A Soviet attack on Finland was now the basic threat for all military planning. The Finns planned to defend their country, and the center of gravity of the defense was in the Carelian Isthmus area. In 1923 Douhet's theory of strategic air attack came for the first time to Finland. An Air Force officer stated that, although the Air Force was needed for cooperation with the army and navy, the most important mission was independent attack against the enemy. This attack would be simultaneously a defense against the enemy air squadrons. The offensive air force would be the only escape. Creating of attack capability was emphasized in another writing. Finland should have a strong offensive force that would be able to achieve air superiority over St. Petersburg and Kronstadt for some hours. The attack was most important, because the fighter defense over home area would not be impenetrable. Anti-aircraft artillery did not get much support.

Employment of the Air Force was a part of the new defense plan that was valid from the autumn of 1923 until 1927. The missions of the Air Force were: control of the air to guarantee mobilization and deployment of army troops, and disruption of enemy mobilization by air attacks. The Commander-in-Chief of the Air Force planned to develop his service, and stressed support of the land battle. His aircraft procurement plan was not accepted, and a British expert group was invited.

The premise of the British memorandum was that Finland was so poor a country that it could not create a first class air force. The aim should be to create so strong an air force that any potential enemy would consider an attack unprofitable. The group saw the role of the Finnish Armed Forces as defensive, but the mission of the Air Force as offensive. The near location of good target areas laid stress on this. This memorandum gave the Air Force a relatively independent role as a strategic weapon. A large bomber force should be developed, but only a small number of aircraft for defense were needed because the protection of important targets was difficult. The tasks to support the army and navy as an assisting service stayed as a role. Bomber planes should be the framework of the Air Force, and aircraft should be mainly seaplanes, although some land based aircraft were needed to the support tasks. The British memorandum was one-sided when stressing air attacks, and it represented a regression compared to the former C-in-C plan. But compared to the doctrinal development in other countries, the

plan was close to the strategic air attack doctrine. Only the mean use of seaplanes, was different. The memorandum became the basis for the development of the Finnish Air Force for almost the next ten years.

In the end of the 1920s the amount of aircraft to be purchased was reduced, and the bomber squadrons should now be equipped by land based aircraft instead of seaplanes. However, domestic studies described air power still in the W.W.I style. In the chain of command, flying units were normally attached to the supported army units.

In the 1930s the defense of independence and territorial integrity became objectives of the military strategy. It was estimated that the only mean to prevent territorial violations was the enemy's belief in Finland's ability to defend herself. In defense plans, only the Soviet threat was taken into account. Military planners also believed that the country would have to meet the attacks alone, without any help of other countries.

In the beginning of the 1930s the General Staff and the Air Force leadership still quarreled on the seaplane question. The General Staff did not anymore accept the Air Force's seaplane plan, and it drafted a new development program. The doctrine in that plan was strongly offensive, but the increase in numbers of both fighter and ground support aircraft reflected new thoughts. The role of fighter planes was important for defense of army troop concentrations. They would also be needed, if war would develop disadvantageously for Finland. The General Staff also drafted a plan for employment of the Air Force in a war against the Soviet Union. It included air attacks against Soviet targets, employment of ground support squadrons for reconnaissance and artillery fire control for the army, employment of fighter aircraft for preventing enemy reconnaissance, and protecting own reconnaissance planes, and cooperation with the navy. The development of the Finnish Air Force followed these plans almost until W.W.II.

Support for a more defensive air power doctrine began to arise from about 1935. The opposition demanded that the main body of the Air Force should be concentrated against enemy air power. The fight could be accomplished both in the air and by attacking air bases, but the first mentioned way would be more effective. Finland's endangered position forced the Finns to seek own solutions, and avoid copying foreign models. Above all, Finland needed small and fast fighter planes that would enable the Finns to destroy enemy bombers. The offensive (strategic attack) role of the Air Force was criticized. The experience gathered in the Spanish Civil War supported these views, however, they were only the view of a minority. Particularly, the C-in-C of the Air Force supported Douhet's theory, and emphasized the purchase of fast bomber aircraft.

Between 1932 and 1939 the roles and missions of the Air Force did not essentially change. The main role was offensive air attack. In the same time, the material gap between Finland and Russia grew, and the possibilities of an offensive Finnish air campaign diminished. In the summer of 1939, the Defense Council finally saw, that in spite of all offensive plans the main stress should be given to defense. The Finnish Air Force should get new fighter aircraft to protect force

concentrations, and to support the ground forces from the beginning of the war. The main role of the Air Force should be defensive counter air. This was now held to be natural, because the country could not purchase large enough bomber fleet as was needed against well protected targets.

The first version of the *Ilmasotaohjesääntö* (Air Force Manual) was published in 1939. It stated: "The general mission of the Air Force in war is to take part in the defense of the country as a combat force. This should be accomplished by attacking enemy troops and infrastructure, by intercepting enemy air attacks and reconnaissance, by reconning activities of enemy troops and operation areas, and by supporting special operations and logistics. In most cases, the objective should be air supremacy. The numerically weaker force could achieve this by concentrating its force, but for maintaining air supremacy, a considerable superiority would be needed."

The first 20 years of the Finnish Air Force was a period of development. Although the economical base was weak, the roles and missions of the Air Force were studied several times. The threat was clear. The role of the Air Force changed from a supporter of the army and navy to an independent attack force, like in many other nations. Several plans were drafted to equip the Air Force. The needs could never be fulfilled, and only a few months before the war broke out, the mistakes in neglecting defense were seen. Possibilities to correct them in the last moment were scarce.

3.4 Air Power in W.W.II

The pre-war thoughts were brought into experiment in W.W.II. Each air force tried to fight by following its doctrine, and using all equipment it had, or what could be developed. The war came too early for all. Countries were not prepared to use their full effort from beginning on.

After the defensive phase in the Battle of Britain, the allied air forces concentrated on air attacks against German targets. In the Western front of the European Theater, an air campaign was the only mean to fight before the invasion was executed. In 1941 the United States Army Air Corps Air War Plans Division developed AWPD-1 (and later AWPD-42) plan. It was based on the strategic air attack doctrine, and resulted to a calculation showing the principal targets, actions, and a force structure needed to win the war by destroying the will and war fighting capability, and supporting the final invasion of Germany.¹⁴ The combined bombing campaign began in 1942. Heavy losses especially in missions against Schweinfurt in August and October 1943 resulted to reshaping the plan. Bombers needed escort fighters, an air superiority had to be achieved, and bombers had to be directed against the German fighter bases and aircraft and oil production. The Normandy invasion was prepared by disrupting the German transportation network.¹⁵ During the last year of the war the allied air forces concentrated on close air support and strategic air attack. The achievement of air su-

premacny, and the combined American daylight precision-bombing with the British night-time aerial bombing did not alone bring the victory, but with the efforts of the other services their contribution was substantial. Bombing made a major contribution to the winning of the key campaigns.¹⁶

The allied campaign in Africa brought a new weakness into light. The British and American air forces were not well prepared for support of ground troops, and the methods of close air support and air interdiction were rough. The battle in North Africa in 1942 - 1943 led to the development of cooperation methods. It also showed that control of the air achieved by offensive and defensive counter air was the prerequisite for support to the ground troops. Only after gaining air superiority, the air forces could concentrate on the army.¹⁷ Based on the North African experience, a new air power doctrine was drafted in the United States. The War Department published the new doctrine, *War Department Field Manual 100-20, Command and Employment of Air Power*, in July 1943. It states, that "land power, and air power are co-equal and interdependent forces; neither is an auxiliary of the other".¹⁸

The Luftwaffe was victorious in the beginning. It could support the army in early Blitzkrieg operations. The Germans were not prepared for strategic air attack, and they could not win the Battle of Britain. In later phases of the war, they had to concentrate on defense of the home area where they could not be successful, when the overwhelming production capability of the United States was brought to effect.¹⁹ Germany had an integrated air defense system, but at first it operated only in too small areas. The system was developed after the air raid against Cologne in 1942. The German air force could move from offensive to defense but although the Luftwaffe used many technical advances, like jet fighters, airborne fighter radar, rockets, precision guided munitions, the allies' combined bombing campaign supported by fighters brought the initiative to their hands, and their production capability guaranteed the victory in the attrition battle.²⁰

In the Pacific theater of war the United States employed its air power in accordance with the strategic air attack doctrine. After preparatory naval air fights, a strategic air campaign was combined with the other means to defeat Japan. In the first phase B-29s flew against Japanese targets from India and China. Later, when adequate air bases were established, air attacks continued from the Marianas. Area bombing showed overwhelming to precision bombing against Japanese cities. In summer 1945 conventional bombing had collapsed Japanese production capacity. Nuclear attacks against Hiroshima and Nagasaki only sealed the victory.²¹

Doctrines developed before the war didn't work as planned. They had to be reshaped or adjusted. The importance of air supremacy and effectiveness of air interdiction and close air support were proven.²² However, as a result of W.W.II, the significance of strategic air attack doctrine was overestimated, and its restrictions were underestimated. Although air power was an important factor in war, it was not alone decisive. The ruling thought of the capability of air power to win the war was wrong.

3.5. Finnish Air Force in W.W.II

The Finnish Air Force was not prepared for a massive attack in 1939. Its doctrine had stressed offensive. The Red Air Force was much larger, and used an air base network from Estonia in the South to the Arctic Ocean. Many of its aircraft were new constructions. Finland had only one squadron more modern fighter planes, and a small number of medium bombers. The rest of the equipment was obsolescent. Soviet planes flew all around Finland, but the center of gravity of the operations was in close support of the Southern Carelian army. The Finns concentrated their best fighters in that area, and although cold winter weather made the defense difficult, Finnish pilots managed to shoot down 121 of the over 1 000 Russian planes during the three months the war lasted. The Finns had two advantages on their side: they used more flexible tactics, and due to the much higher level of training, the pilots were more skillful in combat. Bombers and slow bi-planes flew support missions to the army gathering important information of the Red Army movements. In the last days of the war, fighter aircraft also took part in close air support. The Russians couldn't effectively concentrate their air operations with the ground forces²³.

The lesson of the Winter War was that Finland had too weak an air defense. Between the Winter War and the Continuation War no remarkable doctrinal development happened. Importance of the defense could be seen in material purchases: new fighters arrived already during the Winter War. The neglected anti-aircraft artillery was also strengthened.

In the beginning of the Continuation War, the Finnish Air Force had 307 combat aircraft. Flying units had 164 fighters, 24 bombers and 30 ground support planes in operating condition. The Soviet Air Force had about 400 - 500 older planes on the Finnish front. During the first two weeks, when the Finns concentrated on defense of the home area, Finnish fighter pilots downed 68 planes. During the following offensive phase, all 90 best fighter planes of the Fighter Regiment 2 protected the army offense. All fighter squadrons had restricted operating areas, and the consequence was a reduced efficiency. Reconnaissance and other ground support squadrons were attached to the Carelian Army air commander. The two bomber squadrons were employed to long distance reconnaissance and air interdiction, among others against railway and sea transport. When the army offensive continued, the main mission of fighter squadrons was to protect army movements, especially artillery units. The chain of command was extraordinary: the Air Force Commander-in-Chief took fighter squadrons under his direct control through liaison officers attached into supported army corps and divisions. Because of lacking air surveillance near the advancing army units, liaison officers informed fighter squadrons to scramble interceptions, if they got observations of enemy plains. Although primitive, this method worked. Ground support squadrons continued reconnaissance and close air support including dive-bombing under army air commander. Bomber squadrons continued close air support and interdiction missions.²⁴

After the offensive phase the Air Force units were stationed on a broad area. The chain of command was remodeled. Flying activity cooled down on both sides, except in late 1942, when Finnish fighters fought some large scale air combats on Eastern Gulf of Finland area. Especially the year 1943 was comparatively calm. Bomber squadrons continued interdiction missions, and conducted some successful air attacks against enemy air bases.²⁵

In February 1944, as an attempt to force Finland to surrender, the Soviet strategic long range air force made three night air attacks against Helsinki using over 2 000 sorties. Strong anti-aircraft artillery was successful, and only 5 - 10% of the bombs fall into the target area causing mainly minor damage. Also night fighters were employed, and Finnish bombers followed the attackers to some of their bases.²⁶

Most important part of the Continuation War air operations took place during the Soviet general offensive in June - July 1944. The Red Air Force sent over 1 500 aircraft for support of the attack. On the hottest days, the Finns could count 1 000 - 1 500 sorties. At that time the Finnish Air Force had almost 550 aircraft. Strength of fighter squadrons was 118, but the number of flyable first line fighters was only around 30. Bomber squadrons had 84 medium bombers. The operations center of the Flight Regiment 3 had overall control responsibility of the fighter defense, and coordinated bomber support together with the Flight Regiment 4 from the same facility. A regiment size composed German flying unit supported the Finns. During the defense battle on the Carelian Isthmus Finnish fighters flew over 3 000 sorties, mainly interception and bomber escort. Bombers dropped almost 1 500 tons of bombs in interdiction and close air support missions. The Finns concentrated the defense into a small area. During the battles of summer 1944, fighters of the Flight Regiment 3 achieved over 440 aerial victories when losing only 26 own planes. On one of the hottest days, 28 June 1944, Finnish fighter pilots shot down 43 aircraft of the counted 710 flights in ten combats in Tali-Ihantala area. Altogether, against own 86 fighters lost in air combat, the Air Force downed 1 500 Soviet aircraft, and dropped 4 000 tons of munitions in the Continuation War. Total losses of the Finnish Air Force were 389 aircraft. The Soviet Union lost another 1 500 aircraft in anti-aircraft artillery fire, and an unknown number in other incidents.²⁷

The experience from the Continuation War, especially the defensive phase, was decisive for later doctrinal development: "Air Force leaders understood that a prerequisite for success in air defense was creating an air command area. A small air force could not be divided to army commanders. It should be used as a fist of the air defense area commander. The air command area should provide communications, command posts, bases, and logistic organization."²⁸

When the Finnish Air Force began the war, it was still structurized as a multi-role service. The doctrine developed during the 1920s and 1930s did not serve the defense against a massive aggression. However, in the new situation the service performed comparatively well in its tough mission. Fighter defense managed to restrict the Russian actions, holding often times a local air superiority. The

few reconnaissance units provided tactical and strategic level information, and bomber squadrons supported the army by air interdiction and close air support. Although the role of the air force was limited, it could bring a significant participation to the total effort of Finland's successful defense. Still, the war showed that the Finnish Air Force clearly needed a new doctrine.

3.6 Doctrinal Development after W.W.II

Wars fought after W.W.II have varied in scale. The main implementation for air force doctrines was the Cold War. In spite of realities, for example the United States doctrine stayed unchanged. Only the precision bombing was replaced by air attacks with nuclear weapons, delivered by air and later also by space, causing massive destruction. The United States concentrated on strategic nuclear attack. It didn't recognize the possibilities of lower level wars. The United States Air Force became independent in 1947, and the *FM 100-20* was reshaped in 1953.

The new *United States Air Force Basic Doctrine, AFM 1-2*, stated: "air forces will most likely be dominant force in war; the United States must maintain an air force in instant readiness to launch a full-scale attack; and attacks directed against selected sensitive targets will cause the collapse of the national structure."²⁹

The doctrine was written after the Korean War – a war fought by a quite different way and means. It was also well suited for the Flexible Response policy accepted by President John F. Kennedy administration. The Vietnam War, where air power was successfully used for close air support, did not bring any change to the official doctrine, although air interdiction and strategic bombing could not brake the enemy's ability and will to fight. The doctrinal revisions in 1971, 1974 and 1979 mainly neglected the experiences of the Vietnam War. These versions focused on theater-level conventional warfare. The doctrine still saw strategic actions "involving attacks against vital elements of an enemy's war sustaining capabilities," and "tactical actions (which) are battle-related." They felt that destroying an adversary's capability to wage war would also destroy his will. Even the 1984 version believed in the total destruction of an enemy's capability or will as the military object. It did not discuss adequately how to fight at other than strategic level.³⁰

In 1991, the Gulf War brought to the fore the technology, tactics, and methods on which the United States Air Force had been working since the Vietnam War. Precision guided munitions and advanced navigation systems made the day-night all weather operations possible, and allowed the Coalition to win "the fastest, lowest casualty and most devastatingly destructive one-sided war in recorded history"³¹. That war also brought new theories in light. The execution of Colonel John Warden's five-ring inside-out warfare concept, directed against the Iranian leadership suffered when capabilities had to be wasted to the Scud hunt. At various levels of the war, air power was used in simultaneous attack against multiple nodes, combined with the parallel attack of multiple systems intending to gain exponential benefit.³²

Work to write the next air force doctrine began in 1989. *AFM 1-1, Basic Aerospace Doctrine of the United States Air Force* was ready in 1992. The first of its two volumes was a concise statement of basic doctrine. The second volume was a set of essays providing support for the doctrine. The doctrine was based on experience, systematic, and logically organized. It included all of the principal concerns including organizing, training, equipping, and educating the air force. Space issues were now a part of the doctrine. The doctrine included both strategic and operational level aspects.³³

According to *AFM 1-1*: "War is planned and executed in three levels: strategic, operational, and tactical...Activities short of war have important ancillary benefits...Aerospace forces perform four basic roles: aerospace control (offensive and defensive aerospace control), force application (strategic attack, interdiction, and close air support), force enhancement, and force support... Aerospace control normally should be the first priority of aerospace forces... Strategic attacks are defined by the objective – not by the weapon system employed."³⁴

Some authors have criticized the doctrine stating it neglects the theory development. The critics write that in the 1950s the air force became floating because the theories of competitive means (missiles and space), and ends (deterrence theory) were born. The Air Force abandoned to develop the theory. It should find new, more challenging and motivating means to use military force.³⁵ The Air Force should develop a future theory of integrated use of air and space. It needs creative thinkers, who work a theory, upon which a future concept of warfare, and its doctrine, are based.³⁶ Information warfare as a new form is missing in the current [1992] doctrine. Development on information technology has brought fore the need of integrating it to the doctrine.³⁷

To improve the weaknesses, a new doctrine was drafted in 1995. The proposed *Air Force Doctrine Document 1, Air Force Basic Doctrine* combines theory and experience in one volume. It has separated air and space efforts from each other, and brings out the information warfare. The new doctrine skillfully combines theory, experience, national military strategy, and various types of military operations in the framework of joint and combined operations.³⁸ The *AFDDI* draft states that: "Integrated air and space power now dominate military operations. If the higher aim is to create the conditions necessary for peace, then air and space power will be the nation's preferred options and forces of choice... air and space power is capable of decisive, simultaneous employment at the strategic, operational, and tactical levels of war... is coequal with land and sea power..."

In other NATO countries, the employment principles of air forces were created to counter the possible Soviet attack. The doctrines included all conventional forms to use air power, and developed to the air attack against the enemy second element, follow-on-forces. The United Kingdom and France became part of deterrence strategy by preparing to use air-delivered nuclear weapons. After W.W.II their air forces have participated in colonial wars and other smaller operations.

The Royal Air Force (RAF) published a new doctrine in the beginning of the

1990s. After experience in the Gulf War and in other than war operations, it revised the doctrine in 1993. The doctrine has one volume and guides the employment of air power in peace, crisis, and war. Its purpose is to serve the needs of the RAF, other services, allies, and political leaders. The doctrine analyzes the principles of war, defines air power, its characteristics and application during peace, crisis and war, and gives operational level principles to roles and missions of the Air Force. The doctrine is based on examples of experience.³⁹ In the RAF doctrine, premise of the air strategy is, that: "each conflict will generate its own air strategic priorities. However, when facing an enemy who is capable of exercising air power, priority in air strategy must be given to achieving the required level of control of the air. Experience has shown that unless this is achieved, all other types of air, surface and sub-surface operations become increasingly difficult, and often impossible, to sustain".⁴⁰

The Soviet Union did not recognize a separate air force doctrine. Military dictionary defined doctrine as a belief of the nature and objects of a possible future war, preparing the country and its armed forces for the war and the methods of the war.⁴¹ In the new military doctrine of Russia principles of warfare do not essentially differ from the Soviet era. However, respect for air power seems to be on the increase. Economic problems have greatly degraded the capabilities of the Russian Air Force. If the resources directed to the air forces remain at low level, modern warfare will not be possible for the Russians.⁴²

In many small European countries control of the airspace by surveillance, air policing, and counter air is the main role of the air force. If the resources have allowed, the air force has got a secondary role in cooperation with other services.⁴³

3.7. Development in Finland after W.W.II

After the war, Finland was in a new security situation. Strict limitations regulated the quantity and quality of Finland's defense forces. According to the Paris Peace Treaty, maximum strength of the Air Force was 3 000 airmen. Maximum number of combat aircraft was 60, and the treaty allowed no bombers or missiles. In 1948 Finland signed the Treaty of Friendship, Cooperation, and Mutual Assistance with the Soviet Union. That paper defined the nature of the Finnish defense: Finland provided guarantees that it would not allow its territory to be used for an attack against the Soviet Union, and committed to defend its territory against an attack by Germany or its allies. If needed, the Soviet Union promised to support Finland in defense.

The first defense memorandum after the war was ready in 1949. The Defense Revision memorandum stated that, if Finland wanted to stay out of war and conflicts between superpowers, it needed a national defense capability. Among other means, Finland should have effective defense forces. In 1955 Finland became a member of the United Nations, and the Soviet troops retreated from Porkkala Naval Base near Helsinki. In the late 1950s and early 1960s nuclear weapons

were becoming more significant. Finland saw the development alarming. Also the Berlin crisis in 1961 brought its shadow over Finland.⁴⁴

The first 10 years after W.W.II were a difficult time to the Air Force. The service was disarmed to the level of the Paris Peace Treaty restrictions. It could not achieve new aircraft, and old Messerschmitt fighters served until 1954. To get knowledge of jet aircraft, the Air Force acquired 15 British de Havilland Vampire fighters in 1950s. In the end of the decade it got more jet aircraft from the United Kingdom and France. An air surveillance radar network was build in late 1950s. However, it was hard to find a role for the ill equipped Air Force. In some defense plans, the hypothesis was that in case of a war the Air Force would procure several squadrons of jet fighters, in a way or another. They would be used in air defense and support of the army. Finland's air base network was not strategically good, and most runways were unpaved until the 1960s.

In the aftermath of the Berlin Crisis, it became obvious that the Finnish Air Force could not effectively defend Finland's airspace. Air defense should be modernized. Finland started negotiations to achieve new interceptor fighters and air defense missiles. Paris Peace Treaty was adjusted, and Finland was allowed to buy defensive missiles. A memorandum for development of the Defense Forces in the 1960s was published in 1962. It stated that, if a war between the superpowers broke out, the air space of Northern Finland would probably be violated. Finland's military-political situation in Northern Europe would be linked up with the air and sea strategies of greater powers. In 1963, for the first time since W.W.II, Finland acquired new generation combat aircraft. The Air Force bought a squadron of Soviet Mach 2 MiG-21 fighters. To improve air surveillance, a decision to buy British long range radar system was made in 1962. The range of the new radar network covered Finland's whole airspace.⁴⁵

After 10 years of writing, a new *Air Force Manual* was published in 1965. It described the nuclear war environment, Finland's defense principles, and the role of the Air Force. The Air Force was now organized into areal air defense principle, developed in W.W. II. The role of the Air Force was to support the army and navy, and it's main missions included defensive counter air, reconnaissance, close air support, and air interdiction.⁴⁶ A second volume, operational-tactical doctrine of employment of the Air Force in war was never finished.

Defense policy became a firm part of Finland's national security policy in the 1960s. A common belief was that the probability of an unlimited war was diminished, and also a restricted war was not probable. In that perspective, the strategic position of Finland was not important. The new thought was that Finland needs her Defense Forces for guaranteeing the credibility of foreign policy. Military doctrine got new features in preventing crises and war. In 1966 Finland organized its military services into a new territorial defense structure. The Navy and Air Force stayed under direct command of the Commander-in-Chief of the Defense Forces. The air defense organization was based on the well working system of W.W.II. The limited manpower resources matched with the need to maintain a good level of manning in combat units, have eliminated the multi-layered areal

staff system with its large liaison personnel. Each service has its own operational, material and training responsibilities, and decisions are made without delay at most levels. This system emphasizes effectiveness and calls for good cooperation between the service commanders.⁴⁷ New operative and tactical principles were published in Field Manual⁴⁸ in 1972. In 1974, the Law of Defense Forces⁴⁹ gave for the first time responsibilities fixed by law to the armed forces. However, until the end of the 1970s the doctrinal development in the air force did not go in time with other development.

3.8 Current Air Force Doctrine

The importance of air defense had gradually arisen. In the end of the 1970s, the development of a new weapon family – cruise missiles – added its significance. To intercept cruise missiles, air defense needed new technology. At the same time, military politically more stress was put on the importance of both Northern and Southern areas, as well as Finland's airspace, as a part of the military-political situation in Europe. The importance of Northern Europe was now considered higher, although the situation inside the area was stable.⁵⁰

As a consequence of the growing importance of air defense, the Finnish Air Force acquired new aircraft. All-weather capable Swedish Saab J35 Drakens and Soviet made MiG-21bis planes replaced old day-only capable interceptors in the last half of the 1970s. Lapland Air Command was established, and a fighter group was deployed to Lapland. In the beginning of the 1980s all other older generation aircraft were replaced by new Western European or US aircraft.⁵¹

The Air Force had climbed out from the after war period depression. Its equipment was near the level needed to fulfill its role in the national military strategy. The strategy itself was also well defined. Personnel situation and training capabilities were also improved. Still, there was a need for up-to-date training document to replace the aging Air Force manuals. The Air Force Headquarters drafted a new *Air Force Doctrine*, and published it in 1979. A second revised edition was prepared in 1983.⁵²

The main structure of the new doctrine was: an estimate of the air-strategic situation of Finland, the employment environment of the Finnish Air Force, the basic requirements for the air force, readiness requirements, operating principles in air war, and leadership. The doctrine states: "In peace time, crisis or war, Finland's air space can be violated or utilized. In all situations, the objective of the Air Force is to show that it has the ability and will to control the air space, and intercept the violators... The main role of the air force is defensive counter air operations. They are directed to protect our territorial integrity and the needs of our strategic defense. The Air Force supports the Army and Navy by air defense, information distribution, air reconnaissance, close air support, and air transport."⁵³

The 14 page document gives detailed operational and tactical level instructions to flying units, fighter control, air surveillance, and air base units for peace time, crisis, and war time operations and employment. The doctrine contains more

declarations than explanations. Although the writing of the doctrine was based on the wartime experience, the document does neither include historical nor theoretical backgrounds or other supporting information.

The principal statements of the *Air Force Doctrine* may still be valid. However, development in many areas after its publishing has been revolutionary. The Finnish territorial defense system has changed. Also the security political environment is new: the Soviet Union has collapsed, and Finland is now a member of the European Union. A new security framework for Europe is under construction, and several peace-keeping and peace-support operations are going on under the United Nations, OSCE, and NATO. The military restrictions of the Paris Peace Treaty do not any more obligate Finland. Although Finland has decided to maintain an independent defense and to stay non-allied, she has declared that the doors are open for later new decisions. The Finnish Air Force has also developed, and in the near future it will be in better shape than ever. To meet the demands of the new era, a new *Air Force Manual*⁵⁴ was drafted and accepted for training use in 1995. The purpose of that document is to provide basic information of the roles, missions, and units of the air force. It doesn't take out the need for a document giving the explanations, what, why, and how the air force should do.

4. CHALLENGES AND OPTIONS FOR THE 21ST CENTURY

4.1 Military strategy

To define the role of the Finnish Air Force in the next century, the evaluation of the challenges of the post Cold War era is needed. Certainly, threats against the national security did not disappear when the Soviet Union collapsed.

Around the world, the threats of the future have been described as widespread and uncertain. Conflicts are probable, but often unpredictable. No-one can say certain when conflicts and crises will develop or what course they will take. Commonly, regional instability has been seen as the main threat. Other elements seen endangering the global security are: proliferation of weapons of mass destruction, transnational dangers such as drug trafficking and terrorism, and the dangers to democracy and reform in the former Soviet Union, Eastern Europe, and elsewhere.⁵⁵ Conflicts may be regional in origin, but there is always the risk of spreading. The international community can always be affected, and there would be the obligation both to provide aid and to observe and end the conflicts.

We can diagnose three main concerns for the security in the European continent and its rim areas. The first concern touches upon Russia, which is far from having established stability and an enduring democracy. It is facing a long and extremely difficult period of transition, in which it may suffer setbacks that may in turn lead to violent conflicts within Russia or between the states in the CIS. Secondly, nationalism and regionalism affects the relations of many central and eastern European states. Of this phenomenon, the war in former Yugoslavia is the best example. A third problem area for potential conflicts is the entire region

of southern Europe where regional conflicts are a possibility any time. No-one can rule out the spreading on those conflicts.⁵⁶ The main forums to counter these crises are the North Atlantic Treaty Organization, Western European Union, Organization for Security and Cooperation in Europe, and the United Nations. Most of the more developed countries in Europe are members of the European Union. The EU promotes their economical advantages, but strives to formulate a common foreign policy and possibly also a common defense.

How does the European security political situation reflect into Finland? Finland aims to international security and an order of peace, based on respect of the principles of common values and the international law⁵⁷. As one of the Scandinavian (Nordic) countries Finland is committed to the values of freedom, democracy, and human rights. Finland became a member of the EU in 1995. Finland is militarily non-aligned and maintains an independent defense. Finland is also a member of the Partnership for Peace. Although military non-alignment and independent defense have been building pillars for Finland's defense policy, Finland has agreed to follow the later common foreign policy of the EU.

Both the future common European security policy, and Finland's defense policy are under process to take shape. Without being too speculative, one can assert that the European security policy will aim to counter those risks mentioned above. On the other hand, single countries like Finland see their own special security interests. In Finland's geopolitical situation having fought, and later defended its independence, several times against Russia one can held the uncertain development in Russia as the greatest security risk. For Finland the other developments are more minor risks, although as a defender of the above mentioned values Finland has to act against their violators within the EU. Are there other risks, one could foresee? Environmental changes, rising powers in the Far East, explosion of world population, and collapse of nation states are all phenomena taking place, but their effects are difficult to predict.

Finland has two choices for the future security arrangements: act alone including building on its own defense, or act as a member of the EU within common defense organizations. The future form is still open. If becoming especially a member of NATO, Finland is in a contradictory situation. The membership would add Finland's security guarantees, but on the other hand it would be expensive, and if the situation would develop to an undesirable way, it would change the eastern border of Finland as a possible front-line between Russia and NATO – a Cold War type situation that certainly is not desirable.

Whatever the future political solutions will be, the vital interests of Finland as a nation will be to defend her territorial integrity and to promote prosperity for the citizens. Finland will continue having a strong defense, and to contribute to peace-keeping and other humanitarian and peace-support operations within several organizations. The airspace is an important part of Finland's territory that has to be protected in all situations. The responsibility of the Finnish Air Force is to build a doctrine that guarantees it can provide the contribution needed in fulfillment of Finland's defense policy.

4.2 Evolution of Air Warfare

An examination of the development of air warfare shows clearly that the role of air power has evaluated from a support service to one of the three main elements of warfare. Although air power alone may not be decisive, its contribution may turn the balance of power, it may disrupt the enemy's capacity to fight and his leadership, and disgrace his will to fight. In some cases, air power may be the only military mean needed to force the enemy to loose the will and resist the adversary.

In low intensity conflicts air power can support the army by transportation, air reconnaissance, and close air support. In conventional war air power can be simultaneously employed against strategic, operational, and tactical level targets. It supports land and sea power by providing them several chances to act, and restricts the enemy's operational and strategic chances. When suppressed by air, land and sea power are severely restricted in operations. On the other hand, when supported by own air power, they can operate effectively.

Previously, technical reasons caused limiting restrictions to the performance of air power. Now, computer assisted design has promoted technical development, changing the environment of air warfare. Information techniques provide the gathering of a real time air situation picture supplemented with all needed supporting information, to be utilized in decision making, and making it possible to employ own forces effectively. Stealth technology and defense electronics have improved self protection. Improved fuel economy has extended the range of aircraft. Finally, development in electronics has added the accuracy and lethality of weapon systems.

A great amount of aircraft would have been needed to accomplish the missions planned for Cold War fights between the East and West. When thinking possible future conflicts, one can state that the number of aircraft needed for a certain effort has decreased. That together with rising costs has affected by diminishing the sizes of air forces. A single nation cannot afford to maintain a large scale multi-purpose fighting force. The air force has to be tailored to support the country's vital interest. More important, by coalition building countries can gather a force strong enough to counter the threats they counter.

The development of air warfare now stresses the information management. That side who observes, orientates, decides, and acts faster denies the enemy his time needed to operate. One's military operations have to aim creating and perpetuating a highly fluid and menacing state of affairs for the enemy, and to disrupting or incapacitating his ability to adapt such an environment.⁵⁸ The USAF *Cornerstones of Information Warfare* states: "For airmen, controlling the combat environment is Job One. With the advances in information technology, airmen must pursue information superiority just as they do air and space superiority. Only with these realms under our control can we effectively employ all our combat assets".⁵⁹

4.3. Development of the Finnish Air Force

Since the previous doctrinal document was written, the Finnish Air Force has met several steps of development. The air strategic environment has changed, moving the front lines of Russia's air defense from central Europe to Finland's near areas, and thus adding the significance of the Northern areas. However, economic recession has scrapped the once enormous fighting capability of the Russian Air Force. NATO's air activities have diminished over the Baltic Sea area and in Norway, and its contributions to the Northern Europe has diminished due to the force reductions and downsizing. The Baltic states have only a weak defense. Still, both Finland and Sweden are striving to maintain a reliable air defense in the changing security environment⁶⁰. The Finnish Air Force has worked for improvements on several areas including materiel and personnel sectors. Except renewing its aircraft, the Finnish Air Force has aspired to develop its facilities, air surveillance equipment, and information management techniques and means.

As a main contributor to the fighting capability, the main aircraft of the Finnish Air Force are being renewed between the years 1996 and 2000. 64 McDonnell Douglas build F-18C/D fighters will be final assembled by Finavitech⁶¹. This US Navy combat proven aircraft equipped with new improved systems and advanced medium range active air-to-air missiles will serve as a backbone of Finland's air defense for the next 30 years.

The role of the Finnish Air Force has concentrated to counter air role. Neither equipment, organizations, nor tactics have been developed for close air support, air interdiction, or strategic attack. If the air force should be needed for those roles, it should be carefully prepared for them. This would probably mean changing the concepts of national defense, and stressing the air force financially. Also the personnel strength should be raised. Finally, 64 aircraft are not enough for all possible roles, and buying more fighters should then be considered. In today's situation all this seems to be impossible. Still, if an air force contribution to peace support operations would be needed, the organizations and equipment should be prepared for that purpose. In principle, already the present operating philosophy used by the Air Force would allow sending a fighting unit to a combined mission. What the Finnish Air Force needs, is training together with the other contributing air forces, and resources to finance the extra operating costs.

The Finnish Air Force has contributed at a minimal level in reconnaissance, transportation, and other roles. It can participate in gathering important information. However, it neither can transport large troops, equipment, or humanitarian cargoes to conflict zones all around the world, nor accomplish decisive strategic, operational, or tactical air strikes or attacks. To carry out some or all of these operations would mean changing the structure of the air force⁶². That is impossible, due to the already minimized financial frames, and without changing the core of the Finland's defense principles based on a strong conscripts army⁶³.

5 RESHAPING THE DOCTRINE

5.1 Organizing the Doctrine

When formulating a new doctrine document for the Finnish Air Force, at least the following two decisions have to be taken. Firstly, the writers need to know, to whom they are writing. To gain the most profit, a doctrine should be directed to a relatively large group. It is needed in teaching at several military schools and other institutions. Also, it should be useful, if it could be distributed if needed to politicians responsible for military political decisions. And finally, it should be so precise, military leaders could use it in planning and as a backbone when making decisions. A wide circulation of the document prevents publishing any classified topics or considerations. On the other hand, neglecting classified matters helps to maintain the document at a general, timeless level. Secondly, it should be decided, in which form the document is published. It can be a compact, one volume booklet, or a collection of two or several volumes including the actual doctrine text and defining parts.

The doctrine document is most useful, if it is an unclassified, one volume, compact booklet. It should include the following topics: an introduction to give an overview and some instructions over the use of the document; a description of the nature of air power; and the doctrine itself, divided into strategic, operational, and tactical level parts.

The description of the nature of air power is needed mainly for readers not conscious of the benefits and restrictions of air power. This kind of information is very important for example for other than air force officers. It also helps the air force personnel to understand the specific features of air power.

A division to strategic, operational, and tactical level doctrines helps the handling. Different leaders are responsible for different level matters. Although having an overall responsibility, the Air Force Commander-in-Chief deals at strategic level. Air Command Commanders take care of the operational level decisions. Unit commanders and single airmen operate mainly at tactical level. Although simplified, this division helps understanding the problem field. The matters to be considered at those three levels are clarified in the following chapters.

The doctrine document should deal with both war and other than war operations. All claims should be supported by theory and history.

In teaching the Finnish Air Force uses the following functional division: leadership, airspace surveillance, control of the air, and support activities. Leadership includes operational planning and leading; airspace surveillance consists of air surveillance and intelligence; control of the air includes control, command, and flight operations; all rest of the roles are included in the support activities, among them logistics, communications maintenance, flight technical maintenance, air base activities, and training. The doctrine can follow this sub-division.

The doctrine has to be based on a reliable military-political estimate, and on

estimates of the development of threat and own capabilities. If ignoring these background considerations, the doctrine does not withstand daylight.

5.2 Doctrine at Strategic Level

Before defining the matters dealt in a strategic level doctrine, we still need to take a look into the definitions. What is the strategic level of war? "Strategic level of war – the level of war at which a nation, often as a member of a group of nations, determines national or multinational (alliance or coalition) security objectives and guidance, and develops and uses national resources to accomplish these objectives. Activities at this level establish national and multinational military objectives; sequence initiatives; define limits and assess risks for the use of military and other instruments of national power; develop global plans or theater war plans to achieve these objectives; and provide military forces and other capabilities in accordance with strategic plans."⁶⁴

We have concluded earlier in this study that a strategic level doctrine states the most fundamental and enduring principles. It establishes the framework and foundation for the effective use of air power. More clearly defined, the strategic level doctrine should clarify, how Finland uses the Air Force as a part of the Defense Forces to accomplish national security objectives. More precisely, the doctrine needs to define what are the objectives for the Air Force, how should they be met, and what are the limits and risks for the use of the air force. When studying the employment of air power, the doctrine should tell, what are the core competencies, how should the forces be commanded, and how the operations executed. It should also specify air power missions.

At the strategic level, the doctrine deals with two main areas and one option. The main areas are the role of the Air Force in war and the role in military operations other than war, e.g. peacetime and crises operations. The option is the use of the Finnish Air Force in multinational operations.

As mentioned, the doctrine should define the objectives of the Air Force, divided into peacetime, crises situations, and wartime. The following examples give models how to construct the doctrine. If the current objectives and roles are not changed, the doctrine should explain that in peacetime and crises, the objective of the air force is to defend Finland's territorial integrity. The Air Force will accomplish this objective as a part of several other means by airspace surveillance and air policing. The theory to support this objective could be: the Air Force guards the events in and near Finland's airspace, forms a real-time air situation picture, and starts all measures needed to prevent the violations of the airspace, or uses force if needed. By maintaining this ability the Air Force prevents all speculations of the use of Finland's airspace, and hinders the crisis to spread to Finland. The theory should be supported by history. Several supporting arguments can be found, for example the handling by Sweden and Switzerland in W.W.II, when they prevented the war to spread to the countries by organizing

and maintaining strong air policing over border areas, and forcing tens of both German and allied aircraft to turn away or to land.

The wartime objective of the Air Force has been limited. If no addition to the roles and missions are possible, the current objective to bind the enemy's capabilities and to prevent the unrestricted use of the airspace against important strategic and military targets could be also supported by theory and historical examples. The theory is: by active defensive and offensive counter air, the Finnish Air Force binds the enemy's forces to counter air missions, and by active and flexible counter air operations, limits the effects of the enemy air attacks against strategic and important military targets, making the enemy's air assets useless and its losses intolerable. Again, we can find several historical evidences to support this theory. In the Battle of Britain the RAF could prevent the German success by counter air operations. Also in the Vietnam War, the North Vietnamese fighter operations although due to many interpretable reasons severely affected the US air operations in 1969-71.⁶⁵

The option – employment of the Finnish Air Force in multinational operations could be also argued by a theory: by employing the Air Force in multinational, e.g. peace – support operations, Finland can give a contribution to crises control, showing her will to defend the internationally accepted values. The employment of air power in Bosnia is a good example for this kind of activity.

The strategic level considerations should include the organizing and leadership principles of the Air Force including the chain of command, the relationship between air force and air defense forces, and the main frames for the support given to and that received from the other services. The role of the Air Force as an independent service should be clarified, using the examples of history as evidence.

5.3 Doctrine at Operational Level

The operational level links the strategic considerations and the tactical actions together. The US joint definition to operational level war is: "Operational Level of war – The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activities at this level link tactics and strategy by establishing operational objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives."⁶⁶

Operational level doctrine applies the principles of strategic doctrine into military actions by describing the proper use of air power in the context of distinct objectives, force capabilities, broad mission areas, and operational environment. In the Finnish Air Force, the operational level means planning and performing

missions to accomplish the objectives of the Air Force among the frames of an air defense command area of responsibility.

The operational level doctrine should include the following considerations: principles to divide force at national level, principles to use force in different operations, and principles by which the operations are supported. At this level examples of former conflicts would probably give the evidence needed to support the statements.

At operational level, joint operations are important. The doctrine needs to clarify, how and why the decisions of the use of joint efforts are made.

5.4 Doctrine at Tactical Level

The tactical level of war can be defined as following: "Tactical level of war- The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives."⁶⁷

Tactical level doctrine deals with the execution of roles and tasks. It applies strategic and operational doctrine to military actions by describing the proper use of specific weapon systems, and other types of systems, to accomplish detailed objectives. It establishes detailed tactics, techniques, and procedures guiding the use of specific weapon systems to accomplish specific objectives in engagements and battles.

At tactical level, the doctrine is very near to training manuals and operation orders. At this level the doctrine deals with units, sometimes sub-units, and individual systems. The basic tactics in flight operations, airspace surveillance, and operating the air base units should be formulated in the doctrinal frames.

Concerning air combat, these orders and manuals, the core of fighter tactics, are often classified due to the weapon systems in use. Still, some common level doctrinal statements are needed, and can be drafted.

5.5 Measures to Take

The doctrine does not arise by itself. Several measures should be taken. Air forces use different methods to construct doctrinal documents. The task can be given to a separate board or group, to an official team in the air force organization, or in staff/headquarters, or to a service school.

Whatever the institution is, the writing needs support from the highest level in the air force command. The work may drift to differences in opinions disturbing the whole attempt. If the goal of the work is indefinite, these differences may be never ending.

To reshape its doctrine, the Finnish Air Force needs to act firmly. The Commander-in-Chief needs to give his guidance. The Air Force Headquarters is responsible for military-political, threat, and capability estimates. After these steps

are made, the row work can be delegated to the writer/writers, including the resources needed.

After the new document is drafted, it should be officially accepted, and hopefully without delays. Still, the doctrinal process should continue to meet the demands of the continually changing world.

6. CONCLUSIONS

We have studied the doctrinal definitions, development of doctrines, and their implementation in several countries. Although the doctrine has various definitions, it commonly means fundamental principles by which we guide our actions in support of our objectives. We know that it is authoritative but requires judgment in application.

We use doctrines at different levels. A fundamental doctrine is needed when higher level strategy is defined. For air force use, an environmental-organizational doctrine gives a basic tool for the guidance of air power strategy and tactics.

We should base the doctrine on experience and theory. Air power theories have developed since the Great War. Douhet's theory of air attack is the first recognized air power doctrine. It was further developed, and implemented in W.W.II. That theory emphasized strategic air attack. The other air power roles have not been supported by theories. Still, the importance of the control of the air, air interdiction, and close air support have all been successfully proved in battle. Also air transportation and air reconnaissance among others have played their role. In the Battle of Britain the German Luftwaffe moved from support of the army to strategic attack. Neither was the service built for that role, nor prepared for it. Although strong at tactical level, the mistakes at operational level, and strategic miscalculations led to a failure in that operation. The allied strategic bombing campaign against Germany was also near to a collapse. The theoretical doctrine did not work as well as wished. The tactical level superiority of the P-51s was needed, before the Luftwaffe fighter defense could be broken. Changes at tactical and operational level thinking were needed to support the strategic level success. After W.W.II the strategic air attack theory was very strong, and it has been implemented in several conflicts and countries. Most countries use air power in a more cooperative role with their army and navy. After a several year long development, both the United States Air Force and the Royal Air Force have now well written doctrines. They are both unclassified, and by that way open to our research.

Despite some weaknesses, air force doctrines have presented their importance. Throughout the world, they tell how to use air power, what are the benefits of the chosen roles and mission, and what is the relation of air power to the other services. Altogether, it is important to remark, that the doctrine is only a guideline, it has to be interpreted in the real life situation – the doctrine has to be transformed to the strategy, operational art, and tactics in a current situation.

The doctrinal development of the Finnish Air Force began after W.W.I. In the beginning, arguing concentrated in choosing suitable aircraft. Several so called experts supported sea planes, and it took over 15 years before the superiority of land based aircraft was confessed. Arguing of the role of the Finnish Air Force in a possible war followed international lines. Although organized as an independent service, the Air Force was often held as a supporting service. In the beginning, the doctrine was very offensive – almost nearing Douhet's theory – and air attack was emphasized almost until the Second World War. In 1939 the importance of defense was finally recognized, unfortunately the Finnish Air Force was structurized for splintered multi-role operations. The success in fighting in the summer of 1944 showed the importance of defense, when the Finnish fighter units defended in-land targets, Army troops and Navy ships against Russian bombers and attack planes.

After the lessons learned in the Second World War, the Finnish doctrine changed to the defense of the territorial integrity, especially the airspace. The Paris Peace Treaty restrictions badly depressed the Finnish Air Force. The first rise of the defensive counter air role took place in the beginning of the 1960s. The value of air defense arose again in the end of the 1970s. At that time the current *Air Force Doctrine* was also drafted, pointing out the role of the air force in the defense of territorial integrity. Unfortunately, neither theoretical nor historical background for the employment of the Finnish Air Force was documented.

Many things have revolutionary changed. When evaluating the strategic challenges, the development of air warfare, and the options for the Finnish Air Force, some conclusions can be drawn.

The security political situation is uncertain in two ways. Firstly, we live in an uncertain world. There are several security risks in and near the European continent. The main concern for Finland in the foreseeable future is the development in Russia. Other concerns are associated with the risks Finland has to encounter as a member of the European Union. Secondly, at the time of writing this paper the forming of the common foreign policy and possible common defense within the EU is still uncertain. No-one knows, what will be the forms and arenas, and how the various countries will contribute. For Finland, its important to defend her integrity and promote prosperity and the common values.

The air warfare has developed through technological innovation. Fewer aircraft, more precise weapons, and control of the information flow are some key features.

For the Finnish Air Force the next century gives one main option: the defense of Finland's airspace seems to remain its main role. Contribution in peace-keeping operations in the frames of the EU, NATO, and other organizations may become a new option. The roles and capabilities of the Finnish Air Force are restricted by financial frames. A shift in the principles of the national defense towards a more important role of the air force would be advantageous, but it seems to be impossible, although the air force has not gained quite the importance it should have compared to many other nations. How to guide the actions within

these somehow restrictive frames is the main question in doctrine formulating for the Finnish Air Force.

The Finnish Air Force doctrine needs reshaping to meet the challenges of the next century. The new doctrine should be formulated by taking in account the military-political frames, estimates of threat, and capabilities of the Air Force. It should be a compact, unclassified, one volume booklet. The strategic level doctrine should emphasize the objectives of the Air Force, the operational level doctrine the employment of air power in the frames of the Air Combat Command, and the tactical doctrine should concentrate on basic operations of air force units, sub-units and systems.

Although laborious to draft, an up-to-date air force doctrine is well worth of the work. By strengthening the spirit, it supports the Finnish Air Force in peacetime, crises, and wartime operations. With a reshaped doctrine, the basic idea *Qualitas Potentia Nostra* continues well through the next century.

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- ⁵⁵*National Military Strategy of the United States of America*, U.S. Government Printing Office, Washington, D.C., 1995, i. These main threats can be as a concern of the whole mankind, although their seriousness varies in different areas and countries.
- ⁵⁶General Klaus Naumann, Chief of Staff of the Federal Armed Forces: "The Military Policy Situation in Europe - German Security Policy in an International Context," presentation to the Finnish Defense Academy on 10 June 1993.
- ⁵⁷*Report on security policy of the Government of Finland*, 6 June 1995, published in Helsingin Sanomat, 11 June 1995, D1.

⁵⁸Fadok, David S., *John Boyd and John Warden—Air Power's Quest for Strategic Paralysis*, Air University Press, Maxwell Air Force Base, Alabama, February 1995, 13-20.

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⁶⁰Sweden is constructing its air defense on new JAS 39 Gripen multi-purpose fighters and SAAB AWACS aircraft.

⁶¹A letter of contract was signed in 8 June 1992, after a competition between F-16, Mirage 2000-5, Saab 39 Gripen, MiG-29, and F-18. The quality/cost ratio of the F-18 was clearly superior.

⁶²Equipment of the Finnish Air Force for training and employing the counter air role consists of 27 primary trainers, 54 jet trainers, and about 60 fighters. In addition the air force has 37 utility planes, and 3 transport aircraft.

⁶³Finland's defense budget, about 2 billion USD, is under 4,5 % of the expenses of the state. The defense expenses have varied between 1,5 to 1,9 % of the GDP. They are divided for salaries (40 %), materiel purchase costs (33 %), operating and maintenance costs (25 %), and construction (2 %). The materiel purchase costs will be spent for the F-18 buy in the next few years. In the next century, the army will be stressed, although the air force needs financing for several modifications and procurements. Inside these scarce financial frames, no rapid movements in policy are possible.

⁶⁴Joint Pub 1-02, 363.

⁶⁵Nichols, John B. and Tillman, Barrett, *On Yankee Station, The Naval Air War over Vietnam*, Naval Institute Press, Annapolis, Maryland, 1987.

⁶⁶Joint Pub 1-02, 276.

⁶⁷Joint Pub 1-02, 376.