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A Study on the Effectiveness of ROK Military Mobilization Division as a War Deterrence Function: Focusing on Mobilization Troop

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Abstract

Purpose: This paper is to analyze the military effectiveness of the mobilization resources constituting the mobilization forces and to suggest a plan to strengthen it. The military capability, military potential capacity, and military reputation of the mobilization forces are measures of military effectiveness. Improving the military effectiveness of mobilizing forces will enhance interoperability with the armed forces in peacetime and enhance deterrence capabilities in peacetime.

Method: The research method utilizes literature research and case study techniques. For reference, mobilization policy-related papers and research reports of research institutes will be reviewed, and security experts' advice and case studies of countries operating mobilization forces will be reviewed. The subject of analysis is the troop structure constituting the mobilization division. The troop is the mobilized reserve force which accounts for more than 90% of the unit organization.

Results: The troop structure of the mobilization division shows a poor composition that is less than the minimum economic operation scale. In the Army Standing Division, about 80% of the wartime formation is active duty, while the mobilization division consists of only about 7% active duty soldiers. And about 45% of them are being replaced every year. Mobilization training is also conducted for three days and two nights every year, but the schedule is insufficient for individual combat skills. The period of mobilization training for reserve forces is only 4~8% of that of active duty training.

Conclusion: First, we need to redesign the concept of "mobilization" of the ROK military. Mobilization should be the concept of utilizing well-prepared and trained potential forces with modernized resources for operations in case of emergency. Second, it is necessary to intensively nurture combat reservist by introducing a selective reserve system. The military and government should boldly push ahead with policies to increase the military effectiveness of mobilized resources before the inevitable time of choice, presupposing the pessimistic situation of future security.

Keywords: Mobilization Division, Deterrence, Reserve Forces, Force Structure, Mobilization Troop

1. Introduction

The current international situation is in which the US-led international system and China and Russia are escalating tensions to the extent that it can be called the 'second Cold War', heralding military clashes in the Taiwan Strait and Eastern Europe [1]. The United States is reorganizing its military power as it withdrew its troops from Afghanistan, and is keeping China and Russia in check from emerging as "regional hegemons." This can be interpreted as a paving stone based on the US "offshore balance strategy".

Some strategists worry that when Taiwan is in crisis, Korea could be in trouble too. This is because that the United States may not only call out US forces in Korea, but also request support

from the South Korean military. On the other hand, there is also the possibility of North Korea taking advantage of the situation in Taiwan to make provocations. The Taiwanese military has been using a conscription system since 2018. Taiwan's reserve force is 2.2 million. However, it is evaluated that the effectiveness as a military force is low, such as training only once or twice a year. This point is also acknowledged by the generals of the Taiwanese military. It is difficult to counter the Chinese army with the combat power possessed by the Taiwan Reserve Army[2].

It is necessary to check Korea's defense posture during this time. According to Defense Reform 2.0, the number of South Korean troops will be reduced to 500,000 by the end of this year. The period of military service has been shortened to 18 months based on the Army standard, requiring 200,000 military service resources each year. However, from 2030 onwards, there will be a shortage of young people to join the military. The rate of decline in the youth population goes faster than the rate of military drawdown. By the mid-2030s, military service resources equivalent to the size of five divisions are expected to become scarce. In the end, the military will have no choice but to re-establish defense policy and military strategy with 300,000 to 400,000 personnel.

The military said that it would fill the void in the standing force lacking with advanced weapon systems, but use of AI, drones, and robots in military is still in its infancy[3]. In addition, the reserve force, which is continuously mentioned as an alternative force to the declined standing force, also said that it would make 2.75 million elite, but it is uncertain whether the goal will be achieved with 0.4% of the national defense budget. The military is concentrating its efforts on making the mobilization force elite and improving the mobilization system. This is because these units are combat units that must operate from the front along with the standing forces at the beginning of the war.

This paper intends to analyze the military effectiveness of the troop structure as a part of the mobilization force and suggests alternatives for its insufficiency. Improving the military effectiveness of mobilizing forces will enhance interoperability with the standing army in peacetime and enhance deterrence capabilities in peacetime. The results of this study also include policy and institutional proposals necessary for structural improvement of the mobilization divisions to replace the vacancy of the reduced standing force.

The scope of the study and the subject of analysis is the troop structure constituting the mobilization division. The troop is the mobilized reservist, which accounts for more than 90% of the unit organization. The research method utilizes literature research and case study techniques. For reference, mobilization policy-related papers and research reports of research institutes will be reviewed, and security experts' advice and case studies of countries operating mobilization forces will be reviewed.

2. The Role and Value of Military Power

2.1. Theoretical discussion

Historically, in the international community, countries have secured vital national interests of their own survival and safety through the means of military force. The state pursues strategic competition to achieve its own political purpose and to gain an edge in national relations through the use of military force. A nation's military power is used as a determinant and influence for security, or it performs roles and functions such as a coordinator of international politics or a diplomatic guardian[4].

Even today, most countries recognize military power as a prerequisite for national security and an essential means for pursuing national interests. However, unlike the past, today's military power attaches greater significance to the influence in peacetime than to the importance of military force in wartime. Therefore, the operating concept is also changing[5].

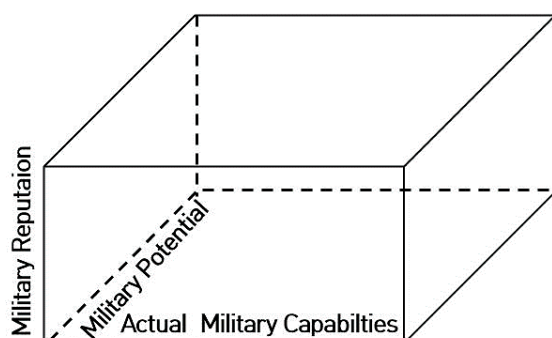
Modern military power is perceived to be more beneficial when it is not used than when it is used. Possession of military power itself is useful. Therefore, military power is more interested in the political relations of the enemy than military objectives of its own. Rather, the use of force has come to mean the breakdown of military force. That country's military capability could be evaluated as low. This means the effectiveness of military force emphasizes that force must not be overtly used. Military power was transformed from warfare to the concept of policy support, and from the explicit use of the military force to the concept of implicit use[6].

Nevertheless, for the survival of the country and the preservation of its core interests, military power is still recognized as an important tool for the performance of national functions. This is because military power is the last resort unless the country's survival instinct and the motive for power domination over the others disappear. Therefore, countries are strategically constructing an appropriate scale of military force and infrastructure in preparation for crisis[7].

South Korea's defense policy and military strategists also recognize that military power is a direct and practical national power for security, and the capabilities and capacities to carry out military operations[8]. Klaus Knorr describes military power by adding military reputation to these. He divided the forms of military power in international politics into war, threat, and reputation. Its success was seen to depend on the components of military power, namely, military capabilities, military capacities, and military reputations[9].

The actual military capabilities are largely determined by the size and composition of the army, equipment and materials, weapon system, and logistical capability. The actual military power is a major factor in determining the strength and weakness of a country's military power, but in an emergency, it could be limited by the quantity and quality of national resources that can be mobilized, that is, its potential capabilities. Military potential affects the structure, capability, and continuity of existing military forces. Therefore, it can be said that a nation's military power is the sum of its actual capabilities, potential, and reputation of the military multiplied as shown in <Figure 1>[10].

Figure 1. Composition of military power.



Ahn KH argues that the reason why the US included the reserve force in its total force policy is because the military effectiveness of the reserve force has been verified. He analyzed that changes in perceptions of the reserve forces by the actors of the Ministry of National Defense, the army, and the parliament and the political and military factors of the reserve forces were influential in this policy decision.

Lee WH analyzed in detail the case of 'Operation Iraqi Freedom' as a successful case in which the US directly deployed its reserve forces for combat missions or used them as combat service support function in the rear area.

Shin DW · Jung CW also argues that the success factors of the U.S. reserve force are due to the “National Defense Act” of 1920 and the “Total Forces Policy” of 1973. Therefore, it is their argument that the Republic of Korea should also be able to play its role as a component of the total force through revision of laws and regulations.

Park JG argues that the reserve force should be included in the ROK military organization in order to establish a desirable military force and to establish the status of the reserve force. Despite the rapidly changing external and domestic environment of the reserve force organization, it points out the duality of the legal system for reasons that are not different from when the reserve force was established.

2.2. Foreign military cases

The United States applies the concept of potential mobilization forces to form its troop structure. About 860,000 reservists are being operated full-time and part-time in a ratio of about 1:9. Full-time employees serve 180 days or more a year during the contract period for the purpose of relieving the service burden of the standing army, and receive the same remuneration and welfare system as active duty service members. They support training preparation, administrative work, and unit equipment management for part-time reserve soldiers. Part-time reserve forces must participate in weekend training for 24 days a year and mobilization training for 2 weeks as a basis. For remuneration, training allowances corresponding to the active duty class are paid for each working day, and weekend training is paid twice as much as weekdays. If you have served 20 years or more as part-time workers, you can receive a pension after the age of 60. It is estimated that the US reserve force can be operated at 14% of the cost of the standing army[11][12].

Israel has a conscription system for men and women, and runs 170,000 standing troops and 460,000 reserve troops. After completing active duty, both men and women serve in the reserve forces. The number of mobilization reserve force is about 400,000, and it is organized into infantry, armored, and mechanized units based on the residential area, and it is elite so that it can exhibit the same combat capabilities as active duty soldiers. There are 54 days per year for service. They take the mobilization training once a year for one week and perform for 25 days operational duty once in a three-year cycle at a designated unit. This is to fill the need for active duty forces lacking in peacetime with reserve forces. It is known that the reserve forces have completed even the brigade general training, and thus their military availability is quite high. When reservists are mobilized, the state pays the same level of remuneration as the social wage for each individual[13].

Singapore has a conscription system for men and has 70,000 full-time soldiers and 310,000 reserve soldiers. In Singapore, all men with citizenship and permanent residency are assigned to the reserve army for 10 years after serving 24 months of military service, and remain available for mobilization at all times. Its size is about 300,000 people. The most of the soldiers are assigned to the battalion for 10 years and participate in mobilization training for 6 to 14 days a year, up to 40 days. Reservist service is 40 years old for soldiers and 50 years old for officers, and the government pays the company-set remuneration for the mobilization reserve army for the number of days participating in training[14].

Germany has the Verstaerkungs Reserve, the Personal Reserve, and the Allgemeine Reserve force. The Verstaerkungs Reserve is about 8,000 soldiers. They serve in the standing military units and mobilization units under the regional defense units in each region. It is managed separately from the standing army, and prepares for the operation of mobilization supplementary

units and regional defense units in peacetime and rapid mobilization in wartime. There are also about 8,000 personnel in the Personal Reserve. These are the reserve forces to support or replace the role played by active duty military personnel. They are managed as part of a standing army formation, and when the reserve army or active duty is absent due to consignment education, overseas dispatch, long-term vacation, health or personal reasons, the duty is performed by substitution. To this end, they receive regular education and training together with active duty officers. The Verstaerkungs Reserve and the Personal Reserve can serve up to 10 months a year in the military during peacetime. The Allgemeine Reserve is a reservist convened when a wartime mobilization order is declared. These are men between the ages of 18 and 60 who have been in the reserve or have not yet served.

3. Problems and Improvements with Mobilization Division

3.1. Force structure with limited combat power

Mobilization force is mostly composed of mobilized resources. This is also a part of the force structure and has a relationship with the organization and composition necessary to perform military missions. The troop structure, a part of force structure, refers to the composition system of manpower for each type of military service and status that forms the military organization[15].

The troop structure of the mobilization division shows a poor composition that is less than the minimum scale economic operational. The army maintains about 40% of active duty compared to that of wartime, but the mobilization division is about 7%. As of 2021, the Mobilization Division is operating in peacetime 7% active duty, 0.1% military personnel, and 0.1% part-time reserve force[16].

Mobilization Divisions must be able to quickly mobilize at an early stage and display combat power immediately due to the nature of their wartime missions. Therefore, securing excellent combatants is important. In order to do this, mobilization resources, that is, reserve forces, must be fixedly assigned to the unit organization so that they can demonstrate their combat power in case of emergency through appropriate education and training throughout the year. This could be also good for the resources effectiveness[17]. However, 45% of the mobilized reservist are being replaced every year as shown in table 1. Mobilization training is also conducted for three days and two nights every year, but the schedule is insufficient for individual combat skills. The period of mobilization training for reserve forces is only 4~8% of that of active duty training. It is preparing for maintaining national security in wartime and peacetime with the fewest days of mobilization training among countries that operate reserve forces [18].

Table 1. Average annual change ratio in mobilization battalion.

	Mobilization designation	Reason for change			Fixed designation
		Subtotal	Annual	Personal	
Ratio(%)	100	~45	25	~20	~55

Note: Figures may vary depending on the unit.

As such, it is not easy at present to designate and manage resources by matching the ranks, classes, and specialties of the reserve forces in accordance with the organization of the mobilization division, and to maintain combat power through sufficient education and training [19]. In addition, even if the right personnel are designated for the organization, it is necessary to extend the training period for the mobilization unit to create and maintain combat power. However it is difficult to even discuss it because it is a sensitive issue that can accompany social conflicts.

3.2. The new concept of mobilization and operation of full-time reserve force

The current concept of mobilization refers to the control, management, and operation of human and material resources for security in case of emergency[20]. However, in the case of the mobilization division, it should be that the concept of mobilization should be reset from the point of view of the modern military utility of 'deterrence' rather than from an economic point of view. The reason is that it is necessary to ensure that the mobilization division can carry out its mission well in wartime. Normally, the time limit for occupying the operational area given to the mobilization division is within 48 hours after the mobilization order is issued. Therefore, the concept of 'mobilization' should be the concept of securing 100% of weapons, equipment, and materials necessary for wartime from normal times and using them [21].

The second reason is to achieve the goal of the Defense Reform[22]. In particular, the mobilization division, the core force among the mobilization units, is assigned to the corps in an emergency. In fact, the mobilization division is carrying out the wartime mission of the decommissioned standing division while reducing 100,000 troops[23]. If the wartime capability of the mobilization division is evaluated as unreliable as a military force, it cannot be evaluated that the defense reform has been completed[24].

In order to secure a stable troop of the mobilization divisions, it is proposed to introduce a system of 'selective reserve' based on the concept of recruitment[25]. These reservists must participate in individual and unit training and mobilization training for two weeks within a range of 40 days per year[26][27]. The recruit target will be preferentially selected from the 1st to 4th years, and then 5th to 8th years of the reserve army, depending on the application rate, the application can be extended up to the age of 40[28]. Compensation for them should be set in an advantageous manner for the reserve army by applying the social hourly wage or the unit cost of construction labor. In particular, double allowance is paid for weekend training [29].

If a mobilization division is formed as a selective reserve and used for operational units, first, it is possible to prepare a force that can replace the insufficient standing force without breaking the framework of the *Levée en masse*[30]. Second, the selective reserve can exert their strong combat power at all times or in an emergency. Third, in terms of the budget required for the operation of the selective reserve, it is possible to maintain the operation with a lower budget than the recruitment system. Fourth, the selective reserve system can measure the public's preference for the future direction of change in the military service system, and can serve as a measure and guide for system components[31].

4. Conclusion

A country's negative reputation for its military power works as an implicit instrument to measure the country's deterring will and the level of its armed forces. The military effectiveness places greater value on deterrence of war than that of physical strength. The state's war deterrence and will to wage war are also the reputation of its political leadership and the people. These are because their resolve and inclinations are projected into defense policies, systems, and military strategies[32].

If living things do not adapt to natural changes, they become extinct. As such, if even a country fails to properly prepare and respond to changes in the international security environment, it will inevitably perish. There is no national interest and prosperity if armaments and reputation are downplayed as the last resort for national survival. Military reputation is hard to gain but easy to lose.

This paper proposes a Korean Selective Reserve System, focusing on the same system of other countries that actively utilize the reserve forces. Before seeking changes of the military service

system, it is necessary to strengthen the reserve force first. Currently, in terms of military effectiveness, there is few gap between active duty and reserve forces in the skills and utilities. The active duty and reserve forces of the South Korean military have already been leveled down. Therefore, with the concept of selective reserve, a part of the reserve forces is selected and equipped with systematic training and mobilization posture every two to three years, but special preferential policies should be pursued. Through this, it is possible to possess and operate more effective war power than in reality. In addition, while operating this system, it is intended to prepare a sound framework for the future military service system, and to secure a balance and flexibility in supply and demand of troops in the standing and the reserve as a total force.

For this, first, the concept of military mobilization must be redesigned. Preparation and training of resources in peacetime should be excluded from the concept of mobilization. Second, the mobilization division must ensure the integrity and stability of the troop structure with selective reservists and maintain the state of completing tactical training.

The Selective Reserve System would be to realize the salaries, allowances and welfare of the reserve in peacetime without compromising the principle of Korea's "Levée en masse". This can be said to be a form of selective recruitment for the reserve. Because it is possible to mix the standing and the reserve, it is able to replenish the military's insufficient strength without changing the current military service system. Even if high-tech equipment is introduced into the military, eventually people must operate it. In order to secure professionalism and flexibility, an environment and conditions must be prepared in which the operating personnel can serve in the military for a long time. Combining military experience and free will, it can be an excellent human resource.

The military power does not have the effectiveness just because it has been replenished. The essential principle is that both the standing and the reserve should be modernized with a standardized weapon system, equipment, and materials, regardless of wartime and peacetime. And the tactics appropriate for each troop must be mastered through sufficient education and training[33].

The military must be well prepared for the overall military force. In order not to endanger the people. For the military to be well prepared, it must prepare for war based on its capabilities at a reasonable level. This is the military's responsibility and duty. With a different approach from the past, the military will have to pursue the construction of a military force that aims to enhance the effectiveness of the military force without distinguishing between the standing and the reserve.

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6. Appendix

6.1. Authors contribution

	Initial name	Contribution
Author	IJ	-Set of concepts <input checked="" type="checkbox"/>
		-Design <input checked="" type="checkbox"/>
		-Getting results <input checked="" type="checkbox"/>
		-Analysis <input checked="" type="checkbox"/>
		-Make a significant contribution to collection <input checked="" type="checkbox"/>
		-Final approval of the paper <input checked="" type="checkbox"/>
		-Corresponding <input checked="" type="checkbox"/>
		-Play a decisive role in modification <input checked="" type="checkbox"/>
		-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/>
		-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/>
		-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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Direction of Military Readiness Posture against North Korea's Provocations against South Korea

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Abstract

Purpose: This article recognizes the dangers of North Korea's continued hostilities, including the sinking of the Cheonan, shelling of Yeonpyeong Island, and missile launches, and raises awareness in order for the forces threatening national security not to be established in our society. The goal is to have a firm military readiness so that we can fully respond to North Korea's provocations at any time and in any form.

Method: In order to analyze North Korea's intentions and threats of provocation toward South Korea, books, academic journals, and dissertations about the provocation toward South Korea were reviewed. Various daily newspapers, news, and government data were studied to recognize the importance of security and derive empirical data for establishing military readiness.

Results: North Korea has carried out military provocations against South Korea in various forms over the past 70 years despite our efforts to improve relations with the North. Until North Korea gives up its hostile policy toward South Korea and takes tangible military measures, it is the main enemy that threatens our security. We must make a clear distinction between the enemy and the ally. In addition, economic aid to North Korea should be continued while strengthening its nuclear deterrence and inducing change in the North. There should be no war, but it should be prepared to respond immediately if there is.

Conclusion: National security is directly related to the survival of the people and is not done by the order of someone. It is important to have the same idea about security, from the leaders of the country, including the president, to all the people. We should keep in mind that national development stems from the people's thorough sense of security and have a security perspective that we protect our country. We should realize the importance of national security and have a firm military preparedness.

Keywords: Security Awareness, National Security, North Korean Nuclear Threat, Provocation Toward South Korea, Military Readiness

1. Introduction

National security is very important and extensive, from protecting families to the issues that determine the rise and fall of a nation. Historically, countries with strong military power prosper and dominate the world, but countries with weak military power suffer from the sorrow of ruin or collapse of the country. The world's great empire 'Roma', which disappeared into history due to its failure to protect security, and 'Persia', which dominated the hegemony of ancient Central Asia, tell this well. The Korean people also experienced the history of great leap and suffering according to the strength and weakness of national defense.

Security is an important issue directly linked to the survival of the state^[1]. Among the many factors of our security threat, the most alarming thing is the military threat from North Korea. With North Korea's reckless and continuous military provocations, various threats from nuclear tests and missile

launches, we are always on high alert. Historically, there have been constant trials of hegemonic competition between neighboring powers and we have been suffering from it, and tensions have risen due to the geographical conditions of the sea and the continent. We must therefore establish more solid and stronger national security.

National security is an abbreviation of the guarantee of a country's safety, which means a state of country without worry, concern, or uneasiness[2]. Although the factors of traditional military threats have declined since the end of the Cold War, security concepts have expanded to non-military sectors such as the economy, environment, disaster, and so on as international relations have become more complex and are with diversity of dangerous factors[3]. Terrorism, in particular, has become an important security risk factor for each country since the September 11th terrorist attacks. In a September 5 last year, Guinea, Africa, the biggest exporter of Bauxite, destabilized its political situation due to a coup and it made international aluminium prices rose to a decade's highest level[4]. This suggests expanding the security concept of economic threats that affect us as well.

Despite North Korea's continued hostilities, including the sinking of the Cheonan, shelling of Yeonpyeong Island, and missile launches, many parts of our society seem to be oblivious to the dangers of their actions[5]. In order to defend liberal democracy and set its identity right, thorough monitoring and vigilance must be taken to ensure that forces that threaten national security are not established anywhere in society. National security is the final goal that we must all work together to protect. This study analyzes North Korea's intention of provocation to threaten South Korea and suggests a firm military preparedness.

2. North Korea's Major Cases of Provocation toward South Korea and Intentions of Threat

2.1. Cases of provocations toward South Korea

Since the armistice agreement until now, there have been 420,000 violations of the armistice agreement by North Korea, and 3,100 cases of North Korea's invasions and provocations[6]. For the past 70 years, to maintain the system of autocratic governance, leaders have been deified and killing people and depress human rights through resident surveillance[7]. Since Kim Jong-un took over as North Korea's supreme ruler, the provocation toward South Korea has become increasingly visible. North Korea's Workers' Party of Korea protocol stipulates that "the final purpose is to think about the subject of Jooche of all society and to build a communist society." While North Korea maintains the invariance of its strategy to redden South Korea, it continues to provoke steadily even now, and the cases of major provocation to South Korea since the 2000s are shown below in <Table 1>[8].

Table 1. Major Cases of Provocation toward South Korea since 2000s.

Era	Period	Major contents
Kim, Jong-il	2000s	2nd Yeonpyeong sea battle(2002), Taepodong 2 launch, Geumgangsan mountain tourist murder(2008), 7.7 DDoS attack, Daecheong sea battle(2009), Cheonan battleship sinking, Yeonpyeong Island shelling(2010), 1st and 2nd nuclear tests.
Kim, Jong-un	2010s	Long-range missile launches(2012), ballistic missile launches, NLL and MDL infiltration(2014), KHNP hacking, DMZ wooden ship mine provocation, SLBM test launches(2015), SLBM test launches(2016), 3rd to 6th nuclear tests.
	2020s	Launch of new tactics and ballistic missiles, bombing of inter-Korean joint liaison offices, killing of west sea officials(2020), Launching cruise and ballistic missiles(2021), and launching various missiles(7 times, January 2022).

The Kim Jong-un era has continued to provoke the third to sixth nuclear tests and various missile launches. The cases by type of North Korea's provocation toward South Korea are shown below in <Table 2>[\[9\]](#).

Table 2. Cases by type of North Korea's provocation toward South Korea.

Method of provocation	Target of provocation	
Military	<Provocation of high strength> ☞ 1st and 2nd Yeonpyeong sea battle, Provocation with wooden warship mine ☞ Shelling of Cheonan battleship and Yeonpyeong Island ☞ A nuclear test, missile provocation	<Provocation of middle strength> ☞ Drone reconnaissance ☞ The murder of a tourist at Geumgangsan ☞ Killing of west sea civil servant
	<Provocation of middle strength> ☞ 7.7 DDoS and Nonghyup's computer network hacking ☞ Hacking of KHNP	<Provocation of Low Strength> ☞ Guardships / fishing vessels infringement of NLL

2.2. Intent of the provocation and threatening of North Korea

Threats are not caused by natural, technical, or engineering problems, but by political, military, social, and psychological problems[\[10\]](#). Since the armistice, North Korea has attempted to assassinate the president, while carrying out various armed provocations against South Korea, including aircraft terrorism, infiltration of armed terrorism, and nuclear tests. The sinking of the Cheonan warship in 2010 was a military provocation with a crime against humanity against South Korea[\[11\]](#). It is analyzed that, at the 75th anniversary of the founding of the Workers' Party on October 10, 2020, North Korea held an unprecedented late-night military parade with the intention of overcoming the current economic and diplomatic difficulties through mobilization of new weapons and residents, and show off new weapons such as ICBMs, SLBMs, and six-launch rocket system against U.S. and South Korea. North Korea's nuclear weapons development, in particular, poses a serious challenge threatening security[\[12\]](#). North Korea's constant provocations are clear evidence that it has not given up its ambition to neutralize the South. The reasons why North Korea continues to provoke missile launches while criticizing the U.S. and South Korea are as follows. A new ICBM was unveiled at the parade[\[13\]](#).

2.2.1. Strengthening the governance and leadership of the Kim, Jong-un regime and strengthening internal solidarity

He is threatening provocations to strengthen internal solidarity through hostile policies toward South Korea and strengthen the Kim Jong-un regime's governance and leadership. In other words, it is a political tactic to promote system solidarity by emphasizing external threats. North Korea is suffering from chronic economic difficulties due to economic sanctions, natural disasters such as flood, typhoons, and border blockages caused by COVID-19. They use it to stabilize the system by instigating complaints from living difficulties and various control measures due to the sanctions policy on North Korea by South Korea and the U.S. It can be seen that North Korea tried to use it to strengthen the succession system while establishing the provocation of South Korea as a military achievement[\[14\]](#).

2.2.2. Exercise of influence on the 2022 election of Republic of Korea

North Korea continues to act to influence elections by raising a sense of crisis in the South. In 2022, there are presidential elections in March and national simultaneous local elections in June. North Korea is trying to create an atmosphere in their favor by separating the people from the government by intensifying its criticism of the South Korean government. It also intends to shift the blame for the strained inter-Korean relations to the South Korean government and create

an atmosphere of instability to vote for those who sympathize with North Korea in the upcoming elections.

2.2.3. Armed demonstrations against the international community and the United States

North Korea's continued missile provocations are a kind of show of force against the international community and the United States. Since the inauguration of the Biden administration, North Korea has been trying to lead dialogue by raising tensions on the Korean Peninsula and drawing attention from the international community. Kim Jong-un said at the 8th Workers' Party Congress in January 2021, "The key to establishing a new U.S.-North Korea relationship is for the U.S. to withdraw its hostile policy." In other words, it is trying to gain an advantage in negotiations with the U.S. by increasing tension on the Korean Peninsula. It is believed that President Moon Jae In's proposal for an end-of-war declaration at the UN General Assembly on September 21, 2021 induces the lifting of sanctions they want.

2.2.4. Inducting South Korea to actively change its policy toward North Korea

North Korea is encouraging the South Korean government to change its policy toward the North through threats of provocations. After President Moon's proposal for an end-of-war declaration in a keynote speech at U.N. General Assembly on Sept. 22, Kim Yo-jong, vice president of central committee of the Workers' Party of North Korea, said on Sept. 24, "If South Korea is not hostile, we are willing to maintain close communication between two Koreas and discuss constructive prospects about relationship recovery and development"[15]. She also said, "I think the end-of-war declaration is an interesting proposal and a good idea to physically end the long-lasting unstable power outage on the Korean Peninsula and withdraw hostility to the other side"[16]. This conveyed a message of an active change in North Korea policy toward the south.

3. Asymmetric Security Threats of North Korea

In the event of a war, North Korea's initial attack will be difficult to sustain due to weakening military power due to economic difficulties and increasing firepower of our military. North Korea's strategic goal against South Korea must be communism on the Korean Peninsula, but an all-out attack could lead to the collapse of the Kim Jong-un regime, so it would not want an all-out war[17]. Therefore, it is believed that a limited attack using asymmetric power will be carried out. Three options of attack strategy are expected to be devised.

First, conventional attacks. North Korea knows it has no chance of winning an all-out war against the powerful Korea-U.S. combined forces. The U.S.-South Korea joint operational plan so far, though least likely, is developing the operational plan for such a conventional North Korean attack.

Second, It is an attack using asymmetric power. Through continuous provocations such as the sixth nuclear test in 2017 and the seventh missile launch in January 2022, Kim Jong-un is maintaining his regime and keeping solidarity with dissatisfied forces. This is the most likely threat as a way to negotiate favorable negotiations with the United States. North Korea can carry out a limited attack on South Korea, not an all-out war. North Korea is poised to carry out regular surprise attacks by deploying about 70% of its ground forces in areas south of the Pyongyang-Wonsan Line. In addition, due to limited attacks on islands in the West Sea, Yeonpyeong Island was shelled in November 2010, but since it is adjacent to Hwanghae-do in North Korea, it is possible to target Yeonpyeong Island and Baengnyeong Island, which are highly exposed to attack[18]. North Korea can attack major military and strategic facilities and secure important areas on the landing coast by infiltrating 260 special warfare units, including air buoys and high-speed landboats, into the rear area. Finally, it is a nuclear and biochemical attack on important

facilities in the Seoul metropolitan area and the country using missiles. North Korea, which is afraid of all-out war, can be the most strategically successful strategy for South Korea and the United States.

Third, the integration of asymmetric attacks and conventional attacks. Attacks on rear areas using missiles will cause social confusion. After seeing our response, we can also engage in an all-out war using conventional power. However, it is unlikely to be realized because it is a dangerous measure that could lead to an all-out military conflict depending on the reaction of South Korea and the U.S., which could lead to the collapse of the North Korean regime. Therefore, it may be said that the most feasible solution is the most likely limited attack by asymmetric power.

4. Importance of Security and the State of Preparedness

The devastating damage that the people and the state were forced to do because the state was powerless speaks well of the importance of security. A historical example of the importance of national security is Israel. During World War II, Israel suffered an unprecedented tragedy in human history, in which more than 6 million people were slaughtered by the Nazis with poison gas. Also, our history of the colony of Japanese Imperialism era tells us how difficult life is for people who have lost their sovereignty. During the colonial period, some women between the ages of 15 and 20 were forced to Japanese Military Sexual Slavery by Japan. Many young people were forced to work for Japan. History shows that if security is not strong, the people cannot protect even the least human dignity[19].

If our security is destroyed by the threat of North Korea, we must live under a closed socialist system instead of liberal democracy, as evidenced by the history mentioned earlier. The lives of the people will also be miserable. Therefore, in order to fundamentally block North Korea's threats and promote stability on the Korean Peninsula, we must be prepared as follows.

First, there is a clear distinction between enemies and allies. Lee, Myung Bak, the former president pursued a pro-U.S. policy and believed that South Korea should form a strong alliance with the United States[20]. Failure to distinguish between enemies and allies could put national security in great danger in case of emergency. South and North Korea are in a state of truce, but they are engaged in warring. The United States, along with us, is a military ally who is restraining North Korea's provocations of war, and who will have to fight against North Korea with the combined forces of South Korea and the United States if the deterrence fails[21]. In the event of an emergency, we must unite with the United States to wage war, and some people who do not like the United States are calling for the withdrawal of U.S. troops. A sense of security that fails to distinguish the enemy from the ally would be a very dangerous situation for our security[22]. International cooperation should also be strengthened to induce dialogue and exchange and cooperation as a peace process[23].

Second, it is the exclusion of unfounded optimism related to the possibility of war and the will of young people to participate. In terms of war prevention, it is a very dangerous idea to vaguely think that North Korea will not be able to wage war because of the economic gap between the two Koreas. Looking at the Vietnam War, it can be seen that no matter how wide the gap in national power is, the war is planned and won to achieve political purposes. In addition, young people's willingness to participate is related to voluntary patriotism. It can be seen that Chinese civil war and the victory of the Taliban in Afghanistan is not determined by the superiority or inferiority of tangible power and military power. We must realize that the difference in mental power, which is intangible power, is the winning or losing decision.

Third, strengthening nuclear deterrence. With inter-Korean relations frozen, preparations for the resumption of North Korea's nuclear negotiations with the United States are uncertain[24].

It is important for us to have nuclear capabilities on our own and substantially contain North Korea's nuclear weapons. However, nuclear development has the advantage of having its own nuclear deterrence and expanding its international status and influence. However, the withdrawal from the NPT could lead to a decline in international credibility, economic disadvantages caused by international sanctions, and cracks in the Korea-U.S. alliance[25]. Therefore, as an alternative, it is necessary to relocate the U.S. tactical nuclear weapons to the Korean Peninsula and use them as a deterrent to North Korea's nuclear weapons. However, there is a problem that it violates the nuclear non-proliferation policy and lacks justification to urge North Korea to give up its nuclear weapons program and causes sensitive reactions from China. If the re-deployment of tactical nuclear weapons is restricted, it can be said that it is a strategy to consider installing storage for tactical nuclear weapons or deploying tactical nuclear weapons at U.S. military bases in the Pacific region. What is curbing North Korea's nuclear threat in the current state is the U.S. large-scale nuclear capability and the commitment of the Nuclear Umbrella to use it for South Korea[26]. As long as the Korea-U.S. alliance is strong, North Korea can seek safety even if its nuclear weapons continue to increase[27]. The response to North Korea's nuclear weapons and missiles should be considered together through dialogue and negotiations and ways to secure independent nuclear deterrence[28].

Fourth, it is to build self-defense preemptive strike capabilities. It is necessary to neutralize support facilities for North Korea's nuclear weapons and secure capabilities to deter nuclear threats in case of emergency by securing preemptive strike measures against North Korea's nuclear threats. In addition, it is necessary to secure monitoring and firing means for the North Korean region, and strengthen hitting assets to hit support facilities. The joint surveillance and target attack radar system, which is a surveillance asset, should also be turned into an early power.

Fifth, it is inducing change in North Korea. Both of strong and soft measurements should be taken properly to change the perception of Kim Jong-un and the leading group, not just the change of the North Korean regime or system. All available measures should be taken to induce change, such as instilling fear that the system could collapse even with nuclear weapons. The UNSC's sanctions on North Korea should make them feel more painful than the past 'March of Difficulties'. It should also improve inter-Korean relations so that North Koreans can experience a liberal democratic system so that they can come out of the international community themselves[29].

Finally, economic aid to North Korea should continue. We should use our superior economic power to induce change in North Korea while supporting what North Korea needs the most. Economic support for North Korea should be properly implemented by judging the degree of implementation of the agreement, such as denuclearization and trust-building measures. It is necessary to clearly set the direction to link the issue of economic support and exchange and cooperation with the nuclear issue. We must face the current situation where we face the threat of North Korea more than any other country[30]. For the peace and unification of the entire Korean Peninsula, it is most important to maintain a strong security posture[31]. In future relations with North Korea, the government should implement its North Korea policy with the possibility that the situation on the Korean Peninsula could return to a crisis situation again, and prepare for military and security readiness[32].

5. Conclusion

North Korea has carried out military provocations against South Korea in various forms over the past 70 years despite our efforts to improve relations with the North. North Korea is a major threat to South Korea's security until it renounces its hostile policy toward the South and takes

tangible military action. We need to know that North Korea is a 'direct and serious threat'. National security is bound to be more important in our reality, which is in a state of truce, not the end of the war. Just looking at the sinking of the South Korean warship Cheonan, shelling of Yeonpyeong Island, and the North's continued nuclear threats and missile provocations, we are always in a state of concern and anxiety.

The Roman master 'Vegetius' said, "If you want peace, prepare for war." Dasan Jeong Yak-yong said, "The military must be prepared for a single day even if it is not used once for a hundred years." The military should be prepared for peacetime and no war should occur, but it should be prepared to respond immediately even if a war occurs. Only when there is a country can there be people, happy families, and live with their dreams to their hearts' content. We need to know how we should live in order to promote patriotism for our country from an early age, strengthen our national defense, and protect our country. North Korea cannot dare to overcome us only when it is a healthy and wealthy country.

It should be remembered that national development stems from the people's thorough sense of security. We must have a strong mentality that I protect my country. National security is not done by anyone, but it starts with a voluntary heart that loves the country and understanding the reality of our divided country. The key to preparing for war is to share the same view on security, from the leaders of the nation, including the president, to all citizens. National security is directly linked to the survival of the people. Until complete peace is established on the Korean Peninsula, we must be firmly prepared to fully respond to North Korea's provocations at any time and in any form.

In the future, follow-up studies should be conducted so that practical proposals for military readiness posture can be made through in-depth research on threats such as nuclear tests and missile launches.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Author	YC	<ul style="list-style-type: none">-Set of concepts <input checked="" type="checkbox"/>-Design <input checked="" type="checkbox"/>-Getting results <input checked="" type="checkbox"/>-Analysis <input checked="" type="checkbox"/>-Make a significant contribution to collection <input checked="" type="checkbox"/>-Final approval of the paper <input checked="" type="checkbox"/>-Corresponding <input checked="" type="checkbox"/>-Play a decisive role in modification <input checked="" type="checkbox"/>-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/>-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/>-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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A Study on the Reinforcement of Military Practical Nursing English in the Armed Forces Nursing Academy: Focusing on TOEIC and Military Practical Nursing English Scores

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Abstract

Purpose: The Armed Forces Nursing Academy is a special-purpose university that trains nursing officers and has a unique curriculum. In Particular, regarding the English curriculum, KAFNA has TOEIC-centered general English education and offers practical English education for military nursing. This study aimed to improve the effectiveness of English education at the Armed Forces Nursing Academy. The researcher identified the relationship between cadets' TOEIC scores and military nursing practical English grades, and this study, based on the relationship, proposed a developmental plan for the English curriculum.

Method: In this study, to confirm the relationship between general English proficiency and military nursing English skill, this study analyzed 4years of accumulated TOEIC scores and military nursing practical English grades of 298 cadets, including graduates 60th ~ 63rd year of KAFNA to find a relationship. First, the correlation between TOEIC test scores and military nursing practical English grades was examined, and a T-test was used to determine whether there were differences in military nursing English proficiency according to TOEIC test scores.

Results: As a result of examining TOEIC scores and military nursing practical English grades of 298 cadets in four years, the 60th year showed a moderate correlation between the TOEIC score and the military nursing English grade, and the 61st~63th year showed a weak correlation. Furthermore, in the case of the 60th~62th year, it was found that there was a difference in the military nursing English score according to the TOEIC score, but there was no difference in the 63rd grade.

Conclusion: It seemed that TOEIC scores were only partially related to military nursing practical English grades. Therefore, to communicate in the situation of military nursing practice, which has a specialized purpose, it is necessary to increase the proportion of military nursing practice English learning. In addition, complementary methods like increasing offered credits or motivating cadets should provide so that they can take an interest in learning English for military nursing practice.

Keywords: TOEIC, KAFNA, ESP, English Curriculum, Military Nursing Practical English

1. Introduction

The Korea Armed Forces Nursing Academy(hereafter referred to as the KAFNA) is a special-purpose university that trains elite nursing officers for the Republic of Korea Army, Navy, and Air Force[1]. Nursing officers trained in KAFNA are responsible for the health of military personnel's in each military service in the Republic of Korea, and are faithfully carrying out the duties of medical research for the advancement of military medical care. The role of nursing officers, however, has been gradually expanded beyond the military[2]. For instance, there was a shortage of medical staff due to the recent spread of COVID-19, 4th grade cadets were put into the forefront of medical care immediately after being commissioned to take care of the health of people. In addition, they have been dispatched to countries around the world such as South

Sudan, Lebanon, UAE, the Philippines and Haiti as a member of a peacekeeping force and has contributed to enhancing the status of the Republic of Korea by attending the health of local soldiers and residents[2].

To keep pace with the demands of the times, KAFNA is providing theoretical and practical English education that reflects the curriculum of KAFNA in order to successfully cope with changes in the future environment suitable for the global era[1]. In particular, for nursing officers who have the characteristics of a nurse and a soldier at the same time, English education in the special area of military nursing practice in addition to English education in the general area is being conducted[1]. Considering the importance of communication in the medical field and the specificity of English for military nursing practice, English for military nursing can be regarded a momentous subject more than general English education. Nevertheless, the current English education for KAFNA is mainly focused on general English skills, including the TOEIC test. In relation to English education of Korea, recently, criticism has been raised that the washback effect of the TOEIC test, in other words, that the purpose of English learning is being transformed into the education for acquiring TOEIC scores rather than cultivating communication proficiency[3][4].

Therefore, in this paper, the relationship between the TOEIC test score, which means the general English proficiency of the cadets, and the score for military nursing practical English are confirmed, and will suggest directions for the development of English curriculum of KAFNA.

2. Theoretical Background

2.1. KAFNA and English curriculum of KAFNA

KAFNA is a special-purpose educational institution that trains elite nursing officers with the goal of nurturing nurses with the highest professionalism and a sense of calling, true soldiers with noble devotion and strong mental power, and future leaders who lead change and practice love for humanity[1]. KAFNA not only conducts nursing education to developed professional nursing knowledge, but military training to develop positive patriotism, a sense of calling, and a sense of duty, the cadets who graduated from KAFNA achieved both degree of military studies and nursing[5]. The dual identity of being a soldier and a nurse is unique to graduates of KAFNA, which is distinct from general universities as well as the Army, Navy, and Air Force Academy.

Cadets of KAFNA are receiving liberal arts education to acquire liberal arts knowledge and cultivate academic literacy as future nursing officers, and English education as a part of the liberal arts education[1].

The English education of KAFNA aims to cultivate talents who can cope with changes in the future operational environment as soldiers and contribute to combined and joint operations in preparation for OPCON transition, and the academy sets differentiated goal of English intensive courses for each grade level to motivate its cadets to improve their English proficiency and to strengthen their global competitiveness through English learning[1]. For English education, General English I, II and English Writing are provided as compulsory subjects for 1st year cadets [1]. 2nd year cadets choose one language between Japanese, Chinese, and English to expand their foreign language experiences[1]. Cadets who choose English, take 1 subject out of English reading & discussion I and Advanced General English in the first term, and 1 subject out of English reading & discussion II and Language & English literature in the second term [1]. Each subject provides 2 hours of education once a week, and 1 credit is awarded. In addition, 1st and 2nd year cadets need to complete intensive English course for 2 weeks in each summer. During this period, TOEIC exam preparation lectures are conducted through test score based divisions. Through those courses, cadets can practice English speaking, sentence organizations, and

cultivate general English proficiency. From each intensive course, cadets earn 2 credits, hence they can achieve 4 credits in total[1].

Table 1. English curriculum of KAFNA.

Category	Subject title	Term	Credit
Core module	General English 1	1 st year 1term	1
	Writing	1 st year 1term	
	General English 2	1 st year 2term	
	Writing	1 st year 2term	
Optional module 1	English reading & discussion 1	2 nd year 1term	
	Advanced general English	2 nd year 1term	
Optional module 2	English reading & discussion 2	2 nd year 2term	0.5
	Language & English literature	2 nd year 2term	
Core module	Military nursing practical English	3 rd year 2term	0.5
Core module (equivalent credit)	English intensive course1	1 st year 1term	2
	English intensive course2	2 nd year 1term	

In addition, as a graduation requirement, cadets must obtain above 810 scores in TOEIC exam until the second term of the third year, which is a relatively high score compared to other military academies, yet majority of cadets meet the requirement after the intensive course[1][6]. Among liberal arts subjects, intensive education is only assigned to English, and it reveals that KAFNA recognize the importance of English in the global era.

Furthermore, in the second term of the third year, practical English education for military nursing is implemented. The Military Nursing Practical English Course is a special subject that is only implemented at KAFNA, a integrated subject of military English and nursing English, and is taught for 2 hours once a week with the goal of communication in military operations and actual nursing fields such as a pediatric ward, and this lecture grants 0.5 credits to cadets. In the 60th and 61st year, 1 credit was given for military nursing practical English, but the 62nd and 63rd year were received 0.5 credit due to the curriculum change.

In this way, 1st and 2nd year cadets are learning for basic and general English communication skills, while 3rd and 4th year cadets who are about to be commissioned learn English for special purposes that can be used in military and nursing(medical) fields. In that sense, the English education system of KAFNA has dual characteristics. The curriculum covers both general English such as basic writing, reading, speaking, and listening which is represented by TOEIC, and English for specific purpose such as military nursing practical English. It is a positive factor that 3rd year cadets who are about to be commissioned learn occupation specialized English, but compared to the time and credits that 1st and 2nd year cadets study in general English, it seems that the quantity of learning hours and giving credits in the military nursing practical English are insufficient.

In particular, military nursing practical English is a significantly special area, and it is necessary to learn thoroughly above the general English skills, such as applying terminology, abbreviations, and different language using of same terms in special contexts.

Therefore, considering the specificity and importance of English for military nursing practice, it is necessary to re-evaluate the current English education system for government officials.

2.2. Characteristics of TOEIC

TOEIC(Test of English for International Communications) was developed by ETS(Educational Testing Service) in the United States in 1979 [7]. Since then, it has been widely used as a tool to measure practical English proficiency necessary for daily life and international work for people whose native language is not English [7]. In particular, it was introduced in Korea in 1982, and is a representative test for measuring general English ability, which is currently being taken by more than 2 million people a year. TOEIC is a test that directly evaluates listening and reading skills with 100 questions each for listening comprehension and reading comprehension, in this process, English communication skills are indirectly evaluated by based on candidates' test results. The topics of TOEIC are focused on business and daily situations, for instance, contract, negotiation, sales, and asking directions to measure language using in practical circumstances [7].

In Korea, about 50 universities, including Korea University and Ewha Woman's University, are allowing an exemption of basic English course completion by submitting TOEIC score above the certain marks, and about 100 universities, including Seoul National University, reflect TOEIC score when their admissions or university transfers. Furthermore, TOEIC scores are reflected or used as reference materials when hiring and promoting public officials, government overseas internships, public institutions, and general companies. This widespread use of TOEIC means that the test is being recognized as an indicator of general English proficiency [7].

These circumstances affects to TOEIC centered English education of many universities in Korea [8]. This is similar to the Army, Navy, and Air Force academies including KAFNA. In each military academy is reflecting TOEIC test scores as a requirement for graduation [9].

However, in recent years, it is also true that criticism of the countercurrent effect in which learning is focused on simply solving problems with the goal of obtaining a high score in the TOEIC test is on the rise [10]. In other words, TOEIC test scores can be improved only with simple problem-solving skills, but many test takers are criticized for not improving their English skills by focusing on improving their problem-solving techniques [11]. It is necessary to pay attention to the fact that a similar pattern may occur in the English education for the national secretary, which is achieved by improving English communication skills in the English field of military nursing practice.

2.3. Overview of ESP

Military nursing practical English is a professional and specific field of English for communication between the military and the nursing occupations. This kind of English is called ESP which stands for English for Specific Purposes, and it requires re-learning because it shows differences in language, words, and context used in daily life. Research trends on ESP are as follows.

Since Canada developed the first well-organized language immersion system in 1965, various Content-Based Instruction(CBI) methods have been introduced and used to improve the language acquisition efficiency through contents. The ESP program was derived from CBI, therefore, CBI teaching approach should be addressed before mention ESP program. CBI has been generally used to explain approaches to integrate instruction with target language and contents such as a language learning through science class; however, previous researchers suggested various definitions of the approach in their studies. For example, Leaver & Stryker [12] argued the CBI

approach as an approach of instructions that attempted to achieve language proficiency by re-locating the aim of the course from language learning to subject learning. This argument shows that CBI considers both contents and language learning, but it is more balanced than former language classes. In English-Medium instruction, CBI aims at both academic knowledge and language learning in the academic context. Basically, CBI assumes two key concepts: first, language learners acquire the second languages in a similar method with their first languages; secondly, a language is effectively acquired when the learner is exposed to the target language in a stimulated environment.

According to Allen[13], there is a significant difference between the former language teaching method and the CBI method because CBI tried integration of language education and subjects in curriculum. Leung & Davison & Mohan[14] noted that unlike the grammar translation method, ESP(English for Specific Purpose), RICA(Reading In the Content Area), and WAC(Writing Across the Curriculum) can be effective methods, which use learner familiar contents from the curriculum, and the curriculum contents can function as important language materials to learners. Therefore, in the CBI method, instructors should deeply understand the subject contents and can lead the learners to the target knowledge[15].

As Met[16] mentioned, the CBI approach is divided in three manners. First, basing on the context of English learning, i.e. English as a second language or a foreign language. Second method is that using target learner's academic level as a standard when instructor selects teaching contents. Finally, it is distinguished according to the balance of the contents and language[17]. The early CBI method was introduced in a particular context, which uses English as the second language or major language, such as the US and Canada[18]. Immigrants had to receive particular English courses to attend school. However, these English courses were not sufficient to fulfill the English proficiency of the immigrants to take academic subjects[18]. The CBI started from the supplement development for students who had to increase their English skills in the above environment[19]. Nevertheless, this approach could not support immigrant students to reach the goal of education[18].

The increasing interest in English teaching approaches and methods related to ESP began in 1960s and 1970s or as an immersion model of teaching both mother tongues and foreign language[20][21]. According to Swale's[22], it was Halliday, McIntosh and Stevens[23] who mentioned the need for ESP at first and then influenced the field of applied linguistics, which eventually made ESP as an independent area for research. In line with the shift of researching and teaching in ELT from EGP for the basic English skills development to ESP, also promoted are CBI or content and language integrated learning[24][25].

This change is intended to boost learner motivation and aid in the acquisition of both language and content. Therefore, learning disciplinary contents takes precedence over language learning in CBI or CLIL. As a result, instructors should carefully select and sequence content elements based on learners' prior experiences and background knowledge, and provide extra learning support and supplementary materials to assist low-level L2 learners in engaging more actively in class activities for the contents covered[26]. Kim[27] examined 958 ESP curricular course descriptions based on website materials from Korea's 60 universities and found that ESP programs are most commonly implemented in engineering and medical fields(247), business areas(245), and hotel and leisure programs(136). Kim reports that the universities investigated offer courses such as TOEIC or TOEFL test preparation English(98), current English studies(88), presentation or discussion in English(87), and interview English programs(57).

She concludes that there is an increasing trend at these universities to offer more ESP-related courses to students in specific majors. There are a number of studies on vocabulary and its learning among the research on ESP because certain terms should be used to acquire disciplinary particular information and skills in each field[28]. For instance, there are studies on a

corpus analysis on maritime English[29], a study on building a corpus on Maritime English learners[30], and research on the relationships between vocabulary and meanings specific to maritime English[31]. Furthermore, Shin and Kim[32] noted the serious lack of ESP programs in Korea and conducted a research study of a needs analysis to prepare learners for the proficiency exam required by the International Civil Aviation Organization(ICA0) since 2008[32]. According to the findings of the survey, which included 530 pilots, 240 controllers, and 22 switchboard operators, Shin and Kim[32] reported that, while experienced workers in the aviation field did not feel the need for daily English, such a viewpoint was concerning because it contradicted the ICAO's concern for aviation safety. Respondents in the survey also stated that English for aviation should be evaluated through face-to-face interviews, and they preferred native English speakers as instructors.

As a study conducted on learners from higher education institutions, Lee[33] investigated 248 college students and discovered that, while they desired speaking skills or ESP/EAP, they preferred general English classes over English-mediated instruction. She concluded that, while a number of ESP programs are offered at the university level in Korea, these programs are implemented without a close examination of possible relationships or links with GEPs offered, or without a systematic study on a needs analysis of a specific group of learners.

In conclusion, as seen above, most of the suggestions and research studies on ESP are from non-English majors such as maritime and aviation fields. In addition, a number of nurse education institutions in the overseas are already aware of the need for EAP education, and related research is being actively conducted. Likewise, research has been conducted in Korea on the demand for practical English ability of nurses[34]. However, there were no previous studies on nursing cadets in Korea. Therefore, the purpose of this study is to understand the necessity of practical English education and the improvement of the current English curriculum by investigating the relation between general English proficiency and practical English skills for a specific group that performs unique tasks as soldiers and nurses.

3. Research Method

3.1. Research model

The purpose of this study was to verify the relationship between the cadets' TOEIC scores of the 60th ~ 63rd year of KAFNA and the military nursing practical English grades. To identify the relations, TOEIC scores and cadets' grades of the course will be standardized, and the correlation between TOEIC scores and military nursing practical English grades will be checked for each year. In addition, we will check the correlation between TOEIC scores and targeted English course grades for all participants. Furthermore, based on the median of standardized TOEIC scores of cadets, set up two groups upper-lower, and identify the difference between the scores and the military nursing practical English grades.

3.2. Research subjects

This study used TOEIC scores and military nursing English scores of cadets from the 60th to 63rd year of KAFNA. For this study, out of a total of 314 cadets, only the data of 298 students were used except for the grades of 16 who were identified as outliers. There are 74 cadets in the 60th year, 74 cadets in the 61st year, 74 cadets in the 62nd year, and 76 cadets in the 63rd year.

Table 2. Descriptive statistics.

Characteristics	Specification	N	%
Grade	60 th	74	24.8
	61 st	74	24.8
	62 nd	74	24.8
	63 rd	76	25.5
	Total	298	100

3.3. Research tools

First, the TOEIC scores of the 60th ~ 63rd year cadets were used. The TOEIC test is an English test hosted by ETS, and in this study, it was implemented as a test to measure general English communication skills. The TOEIC test consists of 200 questions, 100 questions each in the listening comprehension and reading comprehension areas, and is administered for a total of 120 minutes(listening 45 min/ reading 75min). The total score of TOEIC is 990 points, each area is worth 495 points[7]. Standard scores were used in this study.

For military nursing practical English grades, grades from the lectures taken in the 2nd term of the 3rd year were used. Grades for the subject are given in various ways such as the paper-based mid-term and final exam(40% for each), attitude score(10%), and assignment(10%), but only the paper-based test scores that similar to TOEIC test items were standardized and used for data analysis.

3.4. Data processing

The data collected for this study were analyzed using the SPSS WIN 22.0 statistical program. First, frequency analysis and descriptive statistical analysis were conducted to find out the general characteristics of the survey subjects. Second, correlation analysis was conducted to find out the correlation between TOEIC score and the score of military practical nursing English. Third, for each grade level, the upper and lower groups were divided based on the TOEIC average score, and identified the difference in the average score of the group's military nursing practical English grades between the two groups was compared through the t-test.

4. Research Results

This study investigated the TOEIC score and military nursing practical English grade of cadets to reveal the correlation between the two subjects. First, as shown in <Table 3>, the correlation between the normalized TOEIC test scores and normalized military nursing practice English grades for 298 students from the 60th to the 63rd year was .506($p=.000$) for the 60th year, .365($p=.001$) for the 61st year, and 0.231($p=.047$) for the 62nd year, 63rd year were 0.331($p=.003$).

Table 3. Correlation between TOEIC score and military nursing practical english score.

Division		Military nursing practical english score
TOEIC Score	60 th	.506***

	61 st	.365**
	62 nd	.231*
	63 rd	.331**

Note: * $p < .05$, ** $p < .01$, *** $p < .001$.

As shown in <Table 4>, there was difference in the English scores for military nursing practice according to the TOEIC scores of the 60th ~ 62nd-year cadets, but military nursing practice English scores of the 63rd cadets showed no difference.

Table 4. Military nursing practice english score by TOEIC score.

Description		<i>N</i>	<i>M</i> (Standardized)	<i>SD</i>	<i>t</i>	<i>df</i>	95% confidence interval of the difference	
							Lower	Upper
60 th	Lower	37	-.4394	.9475	-4.186***	72	-1.29735	-.46027
	Upper	37	.4394	.8562				
61 st	Lower	37	-.26215	1.13607	-2.322**	72	-.97444	-.07418
	Upper	37	.26215	.77191				
62 nd	Lower	37	-.37009	.84101	-3.407**	72	-1.17326	-.30712
	Upper	37	.37009	1.01928				
63 rd	Lower	38	-.17087	.75794	1.502	74	-.11159	.79509
	Upper	38	.17087	1.18008				

5. Conclusions

The TOEIC scores of the 60th cadets and the military nursing practice English scores showed a moderate correlation, but in the 61st~63th year, there was a weak correlation. Also, as a result of the T-test, there was a difference in military nursing practical English grades based on TOEIC scores for 60th ~ 62nd-year cadets, but no difference in military nursing practical English grades for 63rd cadets.

Those were a weak correlation, which means that TOEIC test that measures English communication ability in daily life, has limitations in measuring English proficiency in a special area of military nursing practical English. In other words, as suggested in previous studies related to military English, it can be said that the English for military nursing practice has a different structure from that of general English education [35]. Therefore, TOEIC preparation centered English learning of 1st and 2nd grade cadets, which is the current curriculum at KAFNA, lacks connection with the practical English learning of military and nursing that assigned for 3rd grade cadet's subject.

When viewed by year, the correlation between the TOEIC test scores of the 60th~61st cadets and the military nursing practical English grade was relatively higher than that of the 62nd~63rd cadets. The reduction of given credit due to the reorganization of the curriculum acted as the reason for the difference, the new curriculum reduced military nursing practical English credit

from 1 credit to 0.5 credit for the 62nd~63th grades. In other words, those results addressed that the cadets' motivation to learn has fallen due to the reduction in credits[35].

When referring to previous studies[6][35] that the learning motivation of cadets is primarily focused on instrumental motivation, the reduction in credits could be the cause of the cadets' unfaithful performance to military nursing practical English classes and exams. The military nursing practical English class principally teach nursing and military-related terms that are different from those used in TOEIC test, hence there is a burden of additional learning of specific terminologies and English expressions. Yet, the reduction in the number of credits given to the course may have reduced the cadets' motivation to learn. This may affect the degree of correlation between the TOEIC test scores and military nursing practical English grades by making the cadets neglect their studies.

Based on the above results, this study suggest the development direction of English education system of KAFNA as followed. First, requesting TOEIC test scores from cadets as a graduation requirement can have a positive effect in terms of motivating learners to learn. However, considering the washback effect, the excessive emphasis on TOEIC test may be rather negative, in respect of improving the ability of the practical English using in military and nursing fields. More study time and motivation are needed for military nursing English for practice in urgent and pressing work site[35].

Therefore, it is necessary to either learn and evaluate military nursing English vocabulary during the running period of the English intensive course for 1st and 2nd year cadets, or to raise the assigned credit of military nursing practical English, which is currently reduced to 0.5 credits, to an appropriate level.

On the other hand, this study has the following limitations. First, the validity of the military nursing practical English test. Currently, experienced instructors have conducted the exam of the subject, but the contents and structure of the exam has not undergone standardization. However, it can be said that the objectivity and fairness of the test have been secured to a certain extent because it was evaluated by an instructors who have been in charge of lectures for many years in KAFNA with specialized knowledge in the field, and only the written test scores are reflected.

Second, in order to accurately measure the communication ability, it is necessary to analyze the cadets' speaking ability and the presentation of the military nursing practical English subject, but KAFNA currently does not implement those assessment in the course. This point will need to be studied in connection with TOEIC speaking test and the presentation or oral examination of the military nursing practical English subject.

Nevertheless, this study is meaningful in that it draws developmental suggestions for English curriculum of KAFNA by examining the relationship between TOEIC test, which measures general English proficiency, and the military nursing practical English grade.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Author	HS	<ul style="list-style-type: none"> -Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/> -Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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A Study on the Establishment and Development of Risk Assessment System for Military Training Field

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Abstract

Purpose: The purpose of this study is to establish the current military training field risk assessment system and study its development direction. To this end, the reality of the Korean military related to the risk assessment of military training sites was analyzed, and the domestic and foreign civilian risk assessment system and the advanced military(US and British forces) risk assessment system were studied to derive implications. The use of the research results will prevent continuous accidents and casualties at military training field, and will contribute to the people's trust in our military and sending their children to the military.

Method: For this study, literature data were studied due to the nature of the study, and data provided by each military headquarters were comprehensively reviewed to reflect the current situation, and statistical data from the Ministry of National Defense and each military headquarters were used to analyze the accident status. In addition, cases of domestic and foreign private risk assessment systems and advanced foreign military risk assessment systems were studied by reflecting various papers and opinions from related parties, and based on the results, the direction for the development of the military training field risk assessment system was suggested.

Results: This paper established a standardized military training field risk assessment system by analyzing the current military training field risk assessment system of the Ministry of National Defense and military headquarters, analyzing domestic and foreign civilian risk assessment systems, and deriving implications for our military through advanced military(US and British) training field risk assessment systems. In addition, the computerization of the risk assessment system and the direction of development linked to other defense networks were presented.

Conclusion: Through this study, we established a military training field risk assessment system that can be used in the entire military, and it is expected to contribute to the prevention of accidents at training field by using it well in field units. In addition, the computerization of the risk assessment system and the development directions linked to other defense networks will provide a direction for the establishment of the military training field risk assessment system in the long run. However, more on-site evaluation and research are required in order for the military training field risk assessment standard proposed by this study to be well utilized in the field.

Keywords: Military Training Field, Risk Assessment, Safety Accident, Accident Prevention, Risk Reduction Measures

1. Introduction

The private workplace risk assessment is in operation in accordance with the Ministry of Employment and Labor's guidelines for workplace risk assessment, but the military training center has insufficient risk assessment to prevent accidents despite recent safety accidents[1]. In order to establish a risk assessment system for military training centers, it was necessary to prepare amendments to the Ministry of National Defense related regulations, detailed guidelines for

risk assessment, and to form internal and external support and consensus on risk assessment systems.

In addition, although the risk assessment for a personal firearm shooting range is stipulated in the training ground installation and management directive, the evaluation system is insufficient compared to the private firearm assessment, and no related regulations have been established for training ranges other than the personal firearm shooting range [2]. A study was needed to ensure the use of benchmarking by related units by preparing a standard plan for the risk evaluation system for major military training centers.

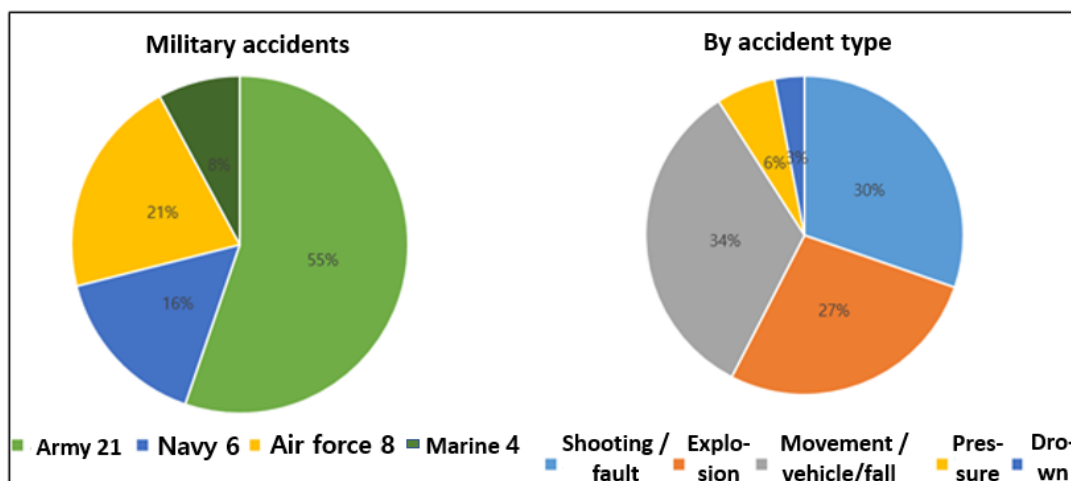
In order to create a safe training environment for all military training centers, it is necessary to establish a risk assessment system suitable for the characteristics of the training center and to use it to improve the risk assessment system for military training centers by reflecting the results of this research service in related instructions. By establishing a risk assessment system suitable for the characteristics of the training ground, It is necessary to improve the standard plan simply and clearly so that it can be used in the field [1]. There should be preparedness for risk, as the risk is already close to the scene of our lives [3].

2. A Study on the Current Status of Risk Assessment System for Military Training Field

2.1. Analysis of accidents related to training ground

<Figure 1> below shows the current status of accidents by group and the type of accidents that have occurred in the training ground or between training over the past six years. The three major accidents at the training ground were accidents between live shooting and misfire, accidents by maneuvering means within the training ground, and explosions [1]. Risk assessment techniques and safety management systems that can be used to prevent such high-risk accidents should be developed, and special measures against high-risk, unlike general risk factors, are needed

Figure 1. Types of incidents by group and type.



Note: Ministry of national defense(2021).

In the past, procedures for identifying and reporting risk factors in training grounds and handling them were not properly established [4]. Prior to 2019, the Army, Navy, and Air Force units did not introduce a risk assessment system, identifying risk factors based on a simple checklist and maintaining a risk management system for high-risk training that shoots and maneuvers at the training ground [5].

2.2. Analysis of risk assessment system for military training field

A comprehensive analysis of the risk assessment system of each military training field lacks the concept of overall training field risk assessment linked to safety management and risk management, and the implementation of risk assessment in the Army and Marine Corps is being applied, but the concept of risk measures, risk communication, and risk review/monitoring has not been established[1].

The Army is simultaneously applying risk assessment in terms of training ground facilities and training ground operation. Other countries are reflecting regulations for the prevention of accidents at training sites in some related regulations, but there are no separate implementation guidelines for risk assessment[6].

Since the enactment of the Ministry of National Defense Safety Management Directive[7], the concept and procedure for the defense safety management system and defense risk management have not been established, so the risk management implementation technique "risk assessment" has been applied differently for each group. The bureau that serves as the basis for the implementation of the training ground risk assessment. The training ground installation and management instructions only list the form and examples of risk assessment, which limits the accurate application of detailed core procedures(risk estimation, decision, reduction measures, and residual risk measures).

Although there are some differences in each group, it is necessary to establish procedures for risk assessment/risk management between training ground management units, training implementation units, and training units.

2.3. Analysis of the risk assessment system of the current defense training field

In relation to the training field risk assessment system at the Ministry of National Defense, Article 14(①) of the Training Field Installation and Management Directive states that a closely cooperated risk assessment system is established between training field control units, management units, and use units to prevent safety accidents[8].

The Army and the Marine Corps are implementing a training field risk assessment system and conducting a risk assessment between the facilities of the training ground, the environment, and the implementation of the training unit through a training field cooperation meeting. However, the risk assessment system between units is different and the related terms are also different, which may be a major risk factor between actual implementations[1]. In addition, the management unit uses the five-stage risk assessment using the form in the training field management system, and the training unit extracts the contents related to the training on the ARAS(Army Risk Assessment System) installed in the interlocking system and uses them to suit the unit's situation[1].

In terms of risk reduction measures for risk assessment, Article 14(②) of the Training Field Installation and Management Directive states that training sites that are capable of reducing risk establishing and implementing risk reduction measures, and training sites that are limited in risk are considered to be closed.

When evaluating the risk of a training ground, there is no clear concept of the "acceptable level" of the risk of each commander, and the scope of the commander's resolution is narrow because there is no concrete plan to deal with the risk after the risk assessment of the training ground. Various reduction measures(risk handling measures) applicable to the commander are studied to increase the efficiency of risk management for the training ground[1].

The risk assessment procedure(workplace) indicates the main procedure of the risk assessment workstation in Attachment 2 of the Defense Training Center Installation and Management Directive[6]. This is different from the procedure of ISO45001's International Standard for Risk Assessment[9] and the procedure of the domestic standard of KOSHA-MS. Therefore, it is necessary to establish a risk assessment procedure by comprehensively considering international standards for risk assessment and domestic risk assessment systems[1].

2.4. The establishment of a risk assessment system for military training field

The Korean military's military training field risk assessment is only a basic form of training field risk assessment at the Ministry of National Defense, and its implementation was delegated to each military headquarters. For this reason, the Army and Marine Corps are doing well according to the guidelines of the Ministry of National Defense, but the Navy and the Air Force aren't conducting a risk assessment of the training field. It is intended to present a direction for establishing a training field risk assessment system at the all military level. First of all, it is desirable for the Ministry of Defense to present and implement a standard plan to apply the military risk assessment system, but the most important thing to focus on is to minimize confusion in the current army and marine corps.

Next, a standard model that can be practically implemented by field units subordinate to each military headquarters should be presented. The feasibility should be guaranteed by specifying the part where there were no detailed implementation guidelines in applying the basic framework of the risk assessment currently in place. In consideration of this, the standard proposal was presented to be simple and convenient for field unit officials to use.

Finally, the military training field risk assessment system should not be an administrative one for reporting the results of the risk assessment. In order for the training field risk assessment system to be established, it should be established to focus on the purpose of preventing accidents by excluding forms from commanding and supervising the training field risk assessment and conducting actual risk assessment on site risk assessment

3. Analysis of Domestic and Foreign Risk Assessment System

3.1. Domestic risk assessment system

In implementing a risk assessment system, a risk assessment refers to a series of processes in which the employer identifies hazards and hazards in the workplace, estimates and determines the likelihood(frequency) and severity(intensity) of injury or disease caused by the hazards, and establishes and implements measures to reduce hazards[10]. The legal basis for employers to conduct risk assessment is Article 41-2(Risk Assessment) of the Occupational Safety and Health Act and guidelines for workplace risk assessment(Notification No. 2012-104, enacted on September 26, 2012)[11].

The introduction of the risk assessment system was based on strong government-led industrial policies from the 1960s and continued until the end of the 1970s[12][13]. As a result of the rapid expansion of the industry in the 1980s, the industrial accident rate steadily decreased after 1997[14][15]. This is because the existing legislation and workplace safety and health management system failed to be reorganized and implemented in accordance with the times, and there were many problems in ensuring the safety and health management performance of the workplace[16][17][18].

According to this diagnosis, the Ministry of Employment and Labor conducted a risk assessment pilot project for three years from 2010 to prevent accidents by autonomously conducting disaster prevention activities, and implemented a risk assessment system for all domestic workplaces from 2013[19][20][21].

3.2. Foreign risk assessment system

The active use of risk assessments abroad was triggered by the 1974 Flixborough explosion in Britain, which killed 28 people and injured 89 others, and the leak in Seveso, Italy, which killed 144 people and injured 7,231 others in 1976. It was an industrial safety and health management system devised by the European Union to prevent further serious industrial accidents after such a series of major industrial accidents, and the risk assessment was initiated in the 1982 Seveso Guidelines(Convention on the Prevention of Major Industrial Accidents)[1].

At this time, the European Commission(EC) recognized the importance of risk assessment and adopted the Council Directive 89/391/EEC to secure and improve the level of safety of member countries[1][22].

Accordingly, EU countries implemented risk assessment systems in earnest as necessary laws and rules were revised by 1992, and the law stipulates that there are no harmful risk factors in workplaces as general obligations such as employers and workers are not exposed to harmful risk factors[23].

In the case of France, in the full text of the Constitution, the state is obligated to protect workers from the risk of industrial accidents, and the state imposes an obligation to prevent industrial accidents on users as a law[24].

In the case of Germany, employers are required to take necessary safety and health measures in consideration of situations that affect the safety and health of workers during work[1].

In the United States, the risk assessment was applied by the Occupational Safety and Health Administration(OSHA). The focus is on providing guidance for risk assessment and disclosure of risk assessment results and methods and data on risk management[1].

3.3. Analysis of the risk assessment system for advanced military(US, UK) military training field

The U.S. military's risk assessment system includes risk management and risk assessment guidelines based on the Defense Ministry's 'Defense Safety and Health Plan', and the Joint Risk Assessment Technology(JRAM) includes detailed guidelines and procedures for risk management. All operational unit commanders are approached in terms of managing threats and risk preparedness, which are also included in the Strategic, Operational and Tactical Guidelines[1]. In particular, the Joint Risk Assessment Tool(JRAT) has been developed and used since 2020 to improve the efficiency of joint training and joint operations through the unification of terms and procedures by identifying the problems of risk assessment conducted by each county. Each county operates a risk management system that meets the characteristics and conditions of the county(25 U.S. Army, risk management), but according to the Ministry of Defense's unified risk assessment guidelines, each county conducts a unified risk assessment based on the form presented in DD Form 2977[1].

In 2020, the British military has significantly revised and supplemented the past risk assessment procedures and unified them in the MOD Form 5010 form of the Ministry of National Defense to operate the risk assessment system. The biggest feature is that risk assessment is divided into 'general risk assessment' and 'detailed risk assessment', and control measures for identified risk factors are applied immediately to evaluate simple risks at the subunit level. If the residual risk is very high as a result of conducting a general risk assessment, a detailed risk assessment is required to be re-evaluated to take additional control measures. In other words, it was improved and supplemented in order to ensure the flexibility of the commanders of the subordinate units for risk assessment as much as possible and save time and effort[1].

3.4. Implications of the domestic and foreign risk assessment system

Based As a risk assessment used by the private sector, international organizations such as ISO, IEC, and EU set risk assessment as an important standard for international safety standards [25][26], and this risk assessment system has the advantage of reducing disasters through the introduction of risk assessment. In advanced foreign countries, the Korean government revised the Occupational Safety and Health Act to introduce a risk assessment system, developed guidelines and explanatory guidelines, and developed programs for risk assessment. The implications of the domestic and international risk assessment system are as follows[1].

First, it is necessary to ensure that the risk assessment system is not formally implemented. Currently, not only does the risk assessment system feel complicated and difficult, but due to the computerized system, it tends to be used to avoid only the legal net or receive incentives.

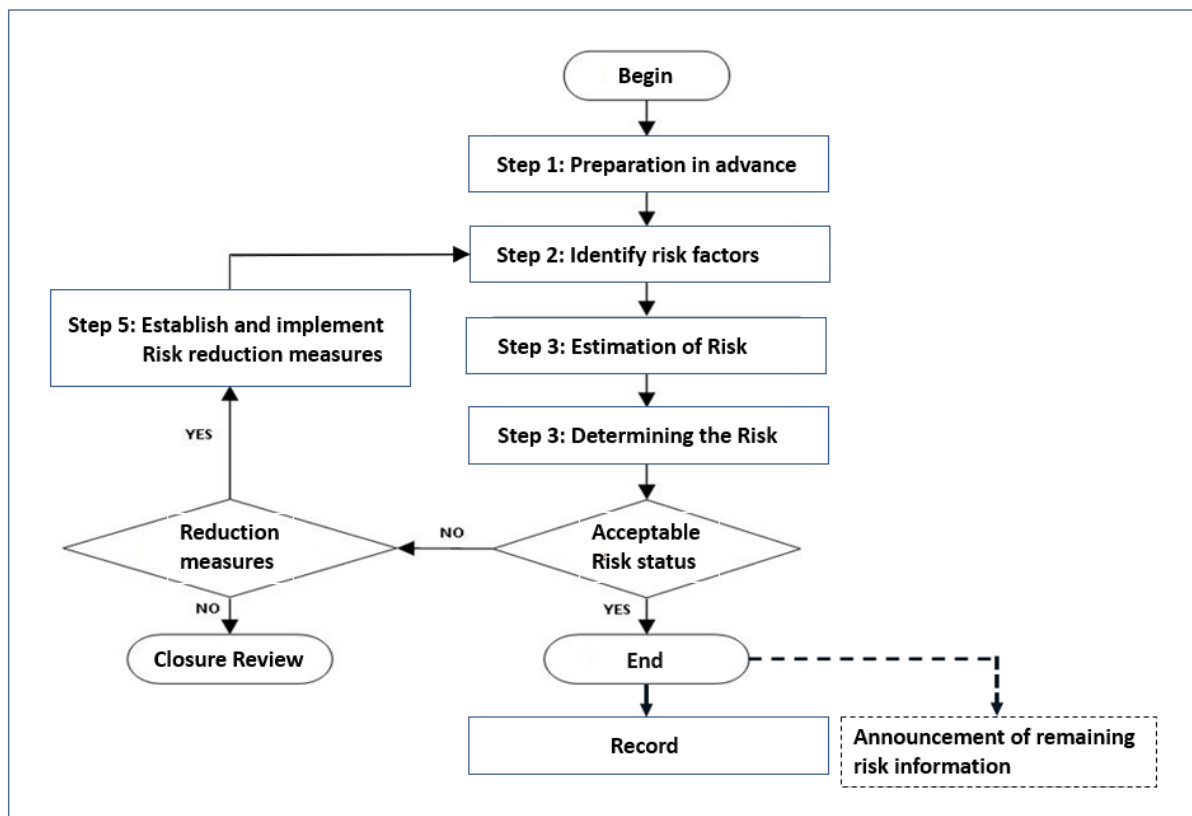
Second, the risk assessment system should be made so that the implementer can easily understand and participate voluntarily and actively.

Third, when general guidelines for risk assessment are formulated, additional supplementation must be continuously implemented for various risk sources to minimize confusion in the implementation process.

4. Standards for Risk Assessment System for Military Training Field

Since risk assessment procedures are divided into five stages in the Occupational Safety and Health Act and the Ministry of Employment and Labor standards, the Defense Ministry's risk assessment procedures are also prepared in five stages, identifying risk factors in the first stage, determining risk in the third stage, and establishing and implementing risk reduction measures in the next stage. <Figure 2> is the standard procedure for risk assessment of training grounds.

Figure 2. Standard procedure for risk assessment of military training courts.



Note: Ministry of national defense(2021).

In First, the first stage is the preliminary stage. Preliminary preparation for the first stage of risk assessment includes establishing a risk assessment plan for the training ground. It collects and analyzes the purpose, method, timing and procedure of assessment, formation of an integrated assessment team, classification of roles of assessors and managers, and basic risk assessment data.

The second step is to identify harmful and dangerous factors. Identifying harmful and risk factors, which is the second stage of risk assessment at the training ground, is to identify harmful and risk factors through various methods. Depending on the training field environment, such as the type and size of the training field, there are methods such as training field tour inspection, checklist method, interview method, and other methods suitable for training field characteristics[27].

The third stage is the risk estimation stage. It is to identify harmful and risk factors and estimate the size of the possibility and severity that can lead to accidents according to the characteristics of the training ground. There are various risk estimation techniques, but due to the nature of the military training center, the risk estimation method using the multiplication method(step 5×4) that can be easily applied by field unit officials is presented as shown in <Table 1>.

Table 1. Standard for estimating risk of training ground.

Sortation		Probability(frequency)				
		Very high (5)	High (4)	Middle (3)	Low (2)	Very low (1)
Seriousness(intensity)	Very serious(4)	20	16	12	8	4
	Serious(3)	15	12	9	6	3
	Normal(2)	10	8	6	4	2
	Low(1)	5	4	3	2	1

Note: Ministry of national defense(2021).

"Risk" refers to the degree of risk and the degree of risk, and it is estimated directly through the multiplication method if the possibility(frequency) and severity(intensity) of the risk are selected based on the criteria for judgment. For this purpose, the criteria for estimating the risk of the training ground were classified as shown in <Table 2>, so that the subsequent risk determination could be made simple and clear.

Table 2. Criteria for estimating the risk of military training field.

Probability of occurrence(frequency)		Seriousness(strength)	
Very high (5)	There is a very high possibility of happens continuously and repeatedly	Very serious (4)	Failure to perform mission, death or failure, serious damage
High(4)	There is a high possibility of multiple occurrences	Serious (3)	Have a significant impact on one's ability to carry out a mission, serious injury, loss, or damage
Middle(3)	Carelessness can cause damage, occasional occurrence	Normal(2)	Injury, loss, or damage that has a certain impact on mission performance
Low(2)	less likely to cause damage, rare occurrence	Low(1)	Can return to work immediately after first aid, minor injury, loss or damage
Very low (1)	Very unlikely to cause damage, hardly happening		

Note: Ministry of national defense(2021).

The fourth stage is the risk determination stage. The risk determination in the fourth stage of the training ground risk assessment is to determine whether the estimated risk(size) is acceptable, i.e. acceptable. It is a very important part of the risk assessment as a step to determine whether risk reduction measures are necessary, and appropriate improvement measures should be devised depending on whether they are acceptable. <Table 3> is the criteria for determining the risk of military training centers.

Table 3. Criteria for determining the risk of military training field.

Risk size	Permissible or not	Improvement method
Very high risk (15~20)	Not acceptable	Immediate improvement
High risk (9~14)		Improve as soon as possible
Intermediate risk (5~8)	Acceptable	Planned improvement
Low risk (1~4)		Improve as needed

Note: Ministry of national defense(2021).

Risk determination is a stage where subjectivity can be involved a lot depending on the judge, so care should be taken not to make an arbitrary decision. The risk determination should determine that the risk size is 'very high risk(15-20)' and 'high risk(9-14)' are unacceptable risks, 'very high risk' should be improved immediately, and 'high risk' should be improved as soon as possible. "Medium risk(5~8)" and "low risk(1~4)" are considered acceptable risks in consideration of military specificity, "medium risk" should be improved systematically, and "low risk" should be improved as necessary and the training ground should be used.

There are various risk factors in the military training ground, and if there is a single case that is not acceptable as a result of the risk determination, improvement and use the training ground can be made, but when there are multiple intermediate risks, the commander must carefully make a risk decision. If there are multiple intermediate risks, the final decision maker, the commander, shall implement reduction measures for all intermediate risks and comprehensively judge the results and approve the use of the training ground when the final risk estimate is intermediate or low risk.

Finally, the fifth stage is the stage of establishing and implementing risk reduction measures. The establishment and implementation of risk reduction measures in the fifth stage of risk assessment at the training ground is to establish and implement measures if the risk determination is not considered an acceptable risk. It is important to evaluate the results of implementation and to re-improve the risk by considering the residual risk, not to terminate the risk reduction measures once they have been implemented.

When the risk assessment of the training ground is completed, the results of the risk assessment, such as the evaluation target, hazard/risk factors, risk estimation, risk determination, and reduction measures conducted, shall be documented and recorded. This is not only useful data for the next evaluation, but also contributes to the prevention of accidents related to the training ground over a long period of time.

5. Development of the Risk Assessment System for Military Training Centers

It was suggested that the development direction of the military training center risk assessment system is largely linked to computerization plans and other defense networks. First, it is a plan to promote computerization. A careful approach is needed to promote the computerization of the risk assessment system at the Ministry of National Defense level. Computerization can reduce administrative waste, utilize various existing data in real time, and record and maintain the results, so it can be a great system if used well. On the other hand, contrary to what most systems expected, they often work separately from the field [28]. It can be said that computerizing the risk assessment system is clearly showing these advantages and disadvantages.

Considering these points, it can be seen that the direction of computerization of the defense risk assessment system is not a system that can be created and promoted overnight, and long-term development plans should be established to promote computerization [29]. First, the first

stage is the stage where the risk assessment system by hand is established as a culture. Therefore, the minimum period of five years(2022-2026) was judged. At this stage, the Ministry of National Defense will submit the risk assessment standards and guidelines to each military headquarters, and each military headquarters and marine corps will establish the risk assessment system as a culture by hand. It is believed that it will take five years to settle into a culture, and during this period, it will be necessary to collect risk assessment data and supplement the DB for computerization. The second stage is to select a demonstration unit and apply computerization. Since computerization can flow formally if it is made and implemented overnight, the risk assessment system rooted in the field over three years is naturally activated by computerization, and individuals or organizations involved need time to adapt[30]. Finally, the third stage is the stage of implementing computerization across the entire military at the Ministry of National Defense level. This period is expected to be possible from approximately 2027, and the risk assessment system can be successfully activated through computerization only after the manual risk assessment system has been established as a culture. At this stage, it can be operated in conjunction with the available defense safety management information system.

Next, it is the direction of development in connection with information systems in other fields related to defense. Comprehensive consideration should be given to preventing and managing safety accidents[31]. This is because the risk assessment system of the military training center and the risk assessment system of other fields should be linked in that the U.S. federal land of the accident is for the purpose of risk assessment.

Because risks are dynamically and continuously changed by various organizations[32], they should be organically linked to other areas of defense, such as accident prevention management system, accident history management system, weapon system management system, education and training system, and weather information system. On the other hand, the defense information system will have no choice but to be linked limitedly because it has characteristics that require high security. Still, it should be promoted so that it can be linked within a limited range.

6. Conclusion

In order to establish a military training field risk assessment system, we analyzed the domestic private risk assessment system, analyzed the overseas military training field risk assessment system, and derived implications for the Korean military to be used in making the training field risk assessment standard.

Through this, the standard plan for the risk assessment system for military training sites at the Ministry of National Defense level was studied and presented. Overall research was conducted on risk assessment methods, appropriate risk estimation and evaluation model standards, risk assessment procedures, risk assessment timing, and records

In addition, by computerizing the risk assessment system and suggesting ways to link it with other defense-related risk assessment systems, the direction of development was suggested so that the risk assessment system for military training field can be systematically implemented

Furthermore, since the standard model was presented simply and clearly to ensure practicality in the field, it will be easy for military training center officials to use it, and it is expected to be used to prevent accidents and minimize casualties even if accidents occur. In addition, we hope that more field evaluation and extensive research will be conducted in the future implementation process so that more developmental research will continue.

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8. Appendix

8.1. Authors contribution

	Initial name	Contribution
Author	SK	<ul style="list-style-type: none"> -Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/> -Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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A Study on Fostering Reserve Forces Capable of Demonstrate the Ability to Immediately Respond of the Korean Armed Forces

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Abstract

Purpose: The main purpose of this article is to explore the plan to foster the experts in reserve forces of the Korean armed forces based on a review of the operation of reserve forces in foreign countries, such as the United States and Germany, in consideration of the rapidly changing international situation and security changes on the Korean Peninsula following the Russian invasion of Ukraine. It is intended to examine the relevant development, and at the same time, while there are differences in terms of policy and implementation aspects, it is intended to make suggestions regarding policy development by deriving implications through the comparative analysis of the reserve forces system of Korea and the United States.

Method: Considering the characteristics of this study, it was primarily composed of literature studies such as official documents, research papers, and related degree dissertations of the Korean and U.S. governments, Internet materials. As examples of the development of reserve forces in foreign countries, including the United States, case analysis of the reserve forces service system and organization method, reserve forces training, etc., were used. Based on which, various implications were drawn for fostering the reserve forces experts for Korea's elite reserve force.

Result: For emphasis purposes, the U.S. and Germany legally maintain the same status as active duty and reserve forces. This is because budgeting and policy establishment for reserve forces are applied in the same manner as in active duty. In particular, the U.S. develops and applies the AGR and ADOS systems based on the legal basis and budget, and operates the reserve force as a unit from the peacetime. However, Korea is currently conducting a short mobilization call training for three days and two nights. In case of emergency, after the general mobilization order is issued, the unit enters into the relevant unit to increase the mobilization and establish the unit. Moving forward, it is necessary to train the reserve forces experts who can contribute to shortening the gap between peacetime and when the general mobilization order is issued.

Conclusion: The lessons learned from the Russo-Ukraine war are the spirit of armed struggle from the leader to the people, the strategy and tactics to operate the weapon system, and above all, the very importance of mobilizing the reserve force that can demonstrate practical combat power in the battlefield in case of emergency. As such, it is very important to prepare a plan for fostering the reserve forces experts in consideration of changes in the international order in the 21st century, declining population, changes in war patterns such as hybrid warfare shown in the Russo-Ukraine war, and Korea's future defense environment, among the key tasks of the Defense Reform 4.0.

Keywords: Russo-Ukraine War, Changes in the Defense Environment, Elite Reserve Forces, Non-Standing Reserve Forces System, Defense Reform 4.0

1. Introduction

The Russian-Ukraine War which broke out on February 24, 2022 is prolonged. The Russian and Ukrainian military power ranks 2nd and 22nd, each respectively. In terms of military power, it is equivalent to the level of “David and Goliath”. The analysis of the Russian-Ukraine War is overwhelmingly a synopsis of the wars that have taken place over the past 100 years. It renders new aspects and characteristics, such as the expansion of the subject of war, the expansion of the battlefield area, and the diversification of the means of war[1][2]. Above all, it is apparent that the reserve force is not able to exert its immediate combat power unless the mobilization system is in place or is not ready. At the same time as the outbreak of the Ukrainian War, a total mobilization order was issued, and only about 36,000 people were initially mobilized[3].

Similarly in Russia, at the beginning of the war, the active duty consisting of 100-120 battalion tactics was first deployed, and as the war prolonged, active duty replenishment soldiers prohibited by law or foreign mercenaries were introduced rather than mobilizing reserve forces. The role of reserve forces among major countries, including the Korean armed forces, has been drawing attention in the wake of the Russo-Ukraine War. In particular, major advanced military countries, such as the United States and Germany, are also making continuous efforts to enhance their reserve forces. Most of such countries are already taking measures to prepare for battle promptly by fostering active duty and full-time reserve forces experts before the wartime mobilization order is declared and the mobilization reserve forces are deployed. Considering the future changes in the defense environment, the development of advanced science and technology, the declining population, and the aging population, it is necessary to re-establish the concept of elite reserve forces and to consider ways to train experts for elite training in order to demonstrate the responsive force at the same time as the declaration of the total mobilization order.

According to the Republic of Korea Army's operating manual on "Mobilization and reserve forces work", “reserve forces refer to the units or individuals that are mobilized in case of emergency and are organized to carry out the national defense related duties such as expansion of active military units or regional defense, while the primary mission is to ensure economic military operation by preparing for troop mobilization, regional defense, and disaster management support, and to contribute to comprehensive security by ensuring the performance of a part of the war deterrent and national total defense”[4].

The advancement of the Korean armed forces into an elite reserve force is one of the important defense policy tasks that have been pursued for a long time. In Defense Reform 2.0, the reserve force was more actively promoted than ever before. Furthermore, the long-term planning document, “Defense Vision 2050,” includes the contents of the defense policy for the elite reserve force[5]. The “Defense Reform 4.0” of the Yun Seok-Yeol administration also included a defense policy for upgrading the reserve force into an elite in consideration of the future defense environment. Considering the war patterns of the Russian-Ukraine War, the declining population and aging, the 4th industrial revolution and the development of advanced science and technology, and the harmony between national security and people's livelihood, the formation of elite reserve forces and fostering reserve forces are not quantitative but qualitative issues. Given such context, the structure of the paper as follows is as follows. Chapter II examines the environmental change of reserve forces operation, Chapter III examines the case of U.S. reserve forces power generation, and Chapter IV proposes a development plan for fostering the Korean reserve forces experts.

2. Plan for the Advancement of the Korean Armed Forces’ Reserve Forces and the Changes in the International Security Environment

2.1. Rapidly changing international security environment and the changes in war patterns

In the 21st century international order, alongside the competition for hegemony between the United States and China, the importance of human security is further strengthened due to the innovative evolution of advanced science and technology of the 4th industrial revolution and the COVID-19 pandemic[6]. In the recent Russo-Ukraine war, an order focused on the U.S., which values a liberal-based alliance, and an order centered on China and Russia, which are regional powers, have clearly surfaced. Due to the Russo-Ukraine war, a change in the war paradigm and a radical change in the power system such as the weapon system are required, and it is also expected to affect the innovation of reserve forces by country[7].

It would be necessary to pay attention to how the concept of military operation and combat performance operating on the battlefield will change, if the development of advanced military science and technology led by the 4th industrial revolution is actually turned into an army. This is a central paralysis based rapid decision operation that has been proven effective in the information age, a new type of non-linear distributed operation centered on small units with strong combat power, multi-domain combat to maximize the synergy effect of the entire battlefield, and the cooperation between human and robot combatants, while the development of the unmanned integrated combat concept is expected to further accelerate. The reserve force also requires more reserve forces and the fostering of reserve forces experts in line with the mission and role of the reserve force rather than sticking to the custom of reusing equipment and material[8].

If the military force of the past focused on traditional security, it now ought to play a complementary role in various security areas in preparation for comprehensive security threats. As we saw in the COVID-19 pandemic, they have maintained a military readiness posture based on the assumed threat of the enemy, but in order to respond to the COVID-19 situation at home and abroad, they have no choice but to support the military power they have. Systematic support such as military medical facilities, professional manpower support, overseas travel, and vaccine transportation was well received by the public. In the places that threaten the lives of the people, such as climate change, epidemics, cybersecurity, and disasters, it has become essential to convert the military power to the concept of national total warfare[9].

2.2. Lessons learned from the Russian-Ukraine war and the decrease in the military service resources due to low fertility and aging

Focusing on the lessons of the Russian-Ukraine War, the formation and development of reserve forces of the Korean armed forces inevitably face a structural reorganization as the military service resources are reduced due to the declining population. By 2022, the number of standing forces will be reduced to 500,000. Instead, they are pursuing a reform of the national defense manpower structure, such as the expansion of cadres, female soldiers, and civilian personnel, and the advancement of reserve forces is being pursued. The 2020 population dead cross has already begun[10]. Korea is the only country in the world with a total fertility rate of less than one person. The total fertility rate in 2020 was 0.837, but in 2021, it dropped to 0.81, and in 2022, it is expected to be 0.7, respectively. The ultra-low fertility is expected to lead to a sharp decrease in military service resources within the next few years, and it seems that it will operate as a major constraint on the recruitment of forces and the operation of reserve forces[11].

Furthermore, the 20-year-old male population will drop sharply from 330,000 in 2020 to 230,000 in 2025 and 155,000 in 2040, and from 2034, 12 years later, the number of people eligible for active duty service per year will be less than the number required by the military, respectively. It is projected that by 2040, after the second declining population, there will be an annual shortage of about 60,000 people. If the available resources on active duty decrease, the

reserve forces will also decrease in series due to the structure in which personnel who have completed active duty are re-entered into reserve forces. The total available resources of the reserve forces in 2040 is estimated to be about 944,000(581,000 reserve forces in the 1st to 3rd years, and 363,000 reserve forces in the 4th and 5th years)[12].

Given such decrease in the fertility rate, it is predicted that by 2040, there will be a shortage of about 90,000 active duty soldiers based on 500,000 people in the standing army and 105,000 people short of reserve forces. Considering that the long-term defense planning is usually effective in 10 to 20 years, alternatives should be prepared in preparation for future reserve force operation from now until 2040. Meanwhile, as Korea enters the age of aging, the working-age population will plunge below 50% by 2050, making it the country with the highest proportion of the aged population in the world. This will lead to deterioration of the national finances due to a decrease in the potential growth rate and a sharp increase in social security costs, which will act as a constraint on the increase in defense spending, and the decline of the reserve forces resources can also be further accelerated[13].

3. Service System and Characteristics of the Non-Standing Reserve Forces of the Korean Armed Forces

The non-standing reserve forces that the military is currently promoting are divided into the two types. The short-term non-standing reserve forces service system is one in which one serves within 30 days a year for positions that can achieve results through relatively short-term operation, while the goal is to recruit 4,093 people by 2024. Furthermore, the long-term non-standing reserve forces service system is one in which one serves within 30 to 180 days per year for positions that require expertise and long-term management. Considering the study result that the standing reserve forces require 10% of the standing reserve forces, it is necessary to increase the number of non-standing reserve forces that are less than 1% of the current standing reserve force by over 10 times refer to <Table 1>.

To achieve this military goal, it is necessary to come up with an alternative, taking into account the difficulties of promoting the U.S. military recruitment system mentioned above. Status, remuneration, occupational characteristics, and welfare benefits for non-standing reserve forces are relatively insufficient. To foster the reserve forces experts for the elite reserve force, it is necessary to analyze foreign cases and prepare in advance in line with the Korean situation. Unlike the U.S. and German reserve forces, the non-standing service reserve forces do not have a military status under the current law, and hence, they are relatively lacking in terms of benefits such as the salary system, military pension, promotion system, and insurance system like active duty soldiers[14]. Furthermore, as there is no legal basis that even veterans can serve as reserve forces, continuous service for a long period of time is limited, resulting in a relatively lack of professionalism. To address such problems, there is a continuous demand for system improvement in the land base to ensure that veterans can serve, including reserve soldiers, in the reserve forces. The recruitment system was established by the U.S. military after about 50 years of trial and error, and in Korea, it is a long-term task that requires many tasks, such as forming a consensus among the people, improving laws and systems, securing the budget, and reorganizing the military structure, subject to continuing research and development [15].

Table 1. Short-term and long-term non-standing reserve forces system.

Classification	Short-term non-standing reserve forces	Long-term non-standing reserve forces
Subject	Reservist - lieutenant colonel ▸ scheduled for recruiting soldiers from 2023	Reservist - lieutenant colonel
Management position	Positions that can achieve results over a relatively short period of time ▸ company and platoon captains, head of squad, etc.	Positions that require expertise and long-term operation ▸ major commanders(person)/staff, combat equipment operation and maintenance personnel, etc.
Nature of work	Field command, combat equipment, and material equipment of lower combat system according to the operational plan.	Long-term, continuous, professional work such as unit establishment plan, operational plan, and all unit Formation. Combat equipment and material management tasks such as weapon system maintenance.
Service period	Within 30 days a year ▸ currently, 15 days	Within 180 days per year

Note: Seol BG. A plan to establish a mobilization immediate response posture in line with roles and responsibilities. *Mobilization Reserve Forces*. 620, 49 (2022).

The non-standing reserve forces system calls for mobilization training for reservists and forces them to serve in the military, but so far they have not received the same benefits as active duty service members. The main limitation is that one cannot receive military pensions, four major insurances, and promotions like active duty officers. First, Article 16(1) of the Act on the Organization of the Republic of Korea Armed Forces was amended to provide, “The Republic of Korea military has military personnel in addition to the military personnel(including full-time and non-standing reservists).” If Article 48 of the Military Service Act is amended to “The service and treatment of persons enlisted in the military due to a call for military force mobilization(training) shall be the same as those of active duty,” the status as a soldier can be guaranteed just like those on active duty. If Article 2 of the Military Personnel Management Act is amended to “reserve service or supplementary service serving in the military by summoning and supporting,” reserve forces will be applied to the Military Personnel Act, which will become the basic statute that can receive benefits such as promotion and pension benefits in the future. As suggested in the 2021 by the Army Headquarters, from among officers, sergeants, and non-commissioned officers who have been retired under Article 3, Paragraph 1 Subparagraph 1-1 of the Reserve Forces Act, they are selected through a certain procedure, which will become a basic law that can be used to guarantee the service of retired executives and extend the retirement age[16].

4. Analysis of Overseas Cases: Characteristics of the U.S. Reserve Forces Service System

With the enactment of the National Defense Act in 1920, the United States had a unified organizational system that included regular forces, national defense forces, and federal reserve forces. After the Vietnam War, it shifted to the recruitment system in 1973, but to overcome the difficulties in manpower supply and demand, it began to combine the forces of the standing army and reserve forces. At the time of payment, the same level of equipment as active duty was provided. The U.S. reserve forces perform their duties in the same status as those of active duty, and are guaranteed the same salary, pension, promotion system, and social security measures. As a result, reserve forces accounted for 61.2% of the standing forces, and were deployed in Iraq and Afghanistan to successfully carry out their missions[17].

The United States is a country of a recruitment system, and active duty recruits under the Recruitment Command recruit for active duty, and full-time reserve forces(Active Guard Reserve; hereinafter “AGR”) recruits for reserve forces. The period of service is 8 years in total, and from the age of 18, one can choose active duty or reserve forces refer to <Table 2>. After 8 years of compulsory service, one can serve up to the age of 60 through the renewal of the contract. If one serves for 20 years or longer, one can receive a pension of up to 40% of one’s active duty service. Furthermore, the salary is set higher than the social life. As of 2021, the minimum annual salary of a sergeant is about 57.5 million won, and 48 million won is paid as a bonus upon enlistment. Despite such extraordinary benefits, the U.S. Army's minimum target for active duty recruitment in 2021 of 57,500(57,606) was met, and the reserve recruiting target was 15,875, but only 11,690 were applied. Hence, in 2022, the bonus upon enlistment is said to be increased to 60 million won[18].

Table 2. Service period of active duty and reserve forces of the United States.

Classification	New recruit training	Active duty	Emergency reserve forces	
			Selected reserve forces (AGR, TPU, IMA)	Personally prepared reserve forces (IRR)
Active duty	-	2-4 years	4-6 years optional * selected reserve forces ⇔ personally prepared reserve forces	
Reserve forces	3-6 months	-	Up to 8 years optional * selected reserve forces ⇔ personally prepared reserve forces	

Note: Yun JW & Bae IS. A plan for fostering the reserve force experts for the advancement of reserve forces. "Implications of the Ukraine incident from the perspective of the reserve forces", 144 (2022).

The unit organization reserve forces(TPU) are affiliated with a training command subordinate to the U.S. Army Reserve Forces Command(U.S.ARC), and all soldiers(100%) from the commander are organized as reserve forces, and they are all organized into the National Guard and Federal Reserve Forces to carry out their missions. Training is conducted for at least 39 days for at least 48 training tasks, and regular training is conducted during normal work life to maintain combat power and, if necessary, perform the mission of dispatching forces. Compared to the Korean armed forces, the mobilization support group appears to be the training command and the mobilization supplement battalion are the TPUs, but the reserve forces before the mobilization supplement battalion are the short-term non-standing reserve forces. Germany's reserve forces are similar to the TPU. The TPU supports the reserve forces, whereas the reserve forces are formed under the standing forces and serve 10 months a year, and are trained in conjunction with the standing forces[19].

To maintain the total force, legal and institutional supplementation that treats reserve forces with the same status as active duty should take precedence. As a civilian, when they are called up in the enlisted unit, they are treated like active duty, but when they declare a general mobilization order, they are converted to active duty. The long-term non-standing reserve forces system must come up with measures to ensure the continuity and professionalism of operation to ensure that it can be operated as a two-job concept. Furthermore, it is necessary to prepare a full-time reserve forces system such as the U.S. AGR system, and to have personnel who work full-time like active duty as reserve forces. The number of Civilian Personnel in active duty units continues to increase. Unlike the active duty, Civilian Personnel are restricted from carrying firearms as civil servants and are not given combat uniforms. Active duty units want comrades who can carry guns and fight together. The full-time reserve forces of the U.S. military are reserve forces, but they carry firearms and wear combat uniforms like active duty soldiers. Because of the permanence of the profession, the professionalism increases over the years. The Korean reserve forces also need to increase their expertise by introducing the same system as the U.S.

full-time reserve forces[20].

Unlike the U.S. and German reserve forces, the non-standing service reserve forces do not have military status under the current law, and hence, they are relatively lacking in benefits such as the salary system, military pension, promotion system, and insurance system like the active duty soldiers[21]. Furthermore, there is a disadvantage in that there is no legal basis that veterans can serve as reserve forces, and hence, the long-term continuous service is restricted, and there is a relatively lack of professionalism. To address such problems, there is a continuous demand for system improvement in the land base to ensure that veterans can serve, including reserve soldiers, in the reserve forces. The recruitment system was established by the U.S. military after about 50 years of trial and error, and in Korea, as a long-term task, many tasks such as forming a consensus among the people, improving laws and regulations, securing the budget, and reorganizing the military structure must be carried out at the same time, which requires the continuing research development[22].

Considering the advantages of such two types, it is also necessary to conduct a follow-up study on how to apply them to the Korean armed forces. The full-time reserve forces(AGR) are full-time reserve forces, accounting for 11.2% of reserve forces, and about 70,000 people are on duty. In the reserve forces, they are serving 24/7 together with military personnel and is a soldier with the same concept as active duty. The main task is to carry out continuous support missions such as training preparation and administration for reserve forces, equipment management, personnel management, and constant support for mobilization and dispatch. This is a form of service that the Korean armed forces do not have, and is also considered as an alternative to overcome the combat mission limitations, which is quite a disadvantage of the reserve forces military personnel. The individual mobilization reserve forces(IMA) are individually formed in the standing forces, and usually about 20 to 30 men serve in the corps. They train at least 14 days per year in muster units and master 0-48 tasks, comparable to the short-term non-standing service reserve forces of the Korean armed forces. These reserve forces(TPU, IMA) are convened for training on two weekends every month for two days, two weeks a year. During one-day training, two days' compensation is differentially paid by rank. It is apparent that they usually receive 320,000 to 740,000 won for one day of training. The individual reserve forces(IRR), unlike the reserve forces, are unorganized and can be selected after active duty or service in the reserve forces. It can be considered similar to the reserve forces designated for mobilization by the Korean armed forces as it is organized primarily for personnel to increase and compensate for losses of the reserve forces, and conducts a one-day called in drill a year[23].

The U.S. military operates a system called the Active Duty Operation Support(ADOS) to support the reserve forces. They are the reserve forces that perform missions for a certain period of time through contract to support the work of the AGR in the reserve forces. Depending on the need, the contract can be signed for 1 to 365 days, up to 5 years, and during the hiring period, the same level of salary and welfare benefits as those of active duty service. When the ADOS recruitment budget is requested, the annual budget is allocated and the unit can freely contract, but in reality, there are few people who satisfy the requirements of the hiring position, and hence, it is often returned. Furthermore, most of them have jobs, and disadvantages at work can be guaranteed by the U.S. SERRA(the Military Employment and Reemployment Act). As a past case, there was a judgement rendered to pay 234 million won in damages to a company that fired a pharmacist who took leave to convene training for the reserve forces, but there are also companies that implicitly create a situation that disadvantages promotion and induces them to retire. This system is similar to Korea's long-term non-standing service system, and when it is expanded, it seems to be a measure to improve combat power by supplementing the mobilization officer positions in the Korean military, yet follow-up studies will be needed to ensure realistic employment conditions even after legal supplements and amendments to the law[24].

5. Closing Remarks

While Korea's long-term non-standing reserve forces system provided legal guarantees of working with active duty for up to 180 days, there are many legal and institutional issues that need to be supplemented in terms of the status, budget formation, and organization of the Korean reserve forces. Furthermore, while the origin and background of the U.S. reserve forces system is different from those of Korea, the following issues should be noted in developing Korea's reserve forces system through the U.S. reserve forces system.

Firstly, the U.S. military legally and institutionally provides that reserve forces are the same as active duty, and based on the law, reserve forces and active duty are interdependent partners to perform missions and dispatch forces to areas in need in case of emergency. Secondly, the reserve forces budget is 9% of the national defense budget (about 60 trillion won), and 75 million won per year is allocated to one person of the reserve forces. The AGR system and the ADOS system are operated efficiently to ensure that the reserve forces supporting them can perform their missions immediately. Thirdly, in order to strengthen the Republic of Korea-U.S. alliance, the reserve force has been formed into units and has been operated as a military organization since peacetime. It is necessary to maintain an appropriate size of the standing force and at the same time build a strong reserve force to effectively operate the military force in case of emergency[25].

With reference to such implications, the Korean armed forces also need to improve the legal area to ensure that reserve forces could become soldiers in peacetime to improve their treatment, and to develop full-time and non-standing reserve forces systems that applied the AGR system or ADOS system to reserve forces, and develop a policy of holistic reserve forces, such as by forming a reserve force-oriented unit that trains experts and conducts regular training with the standing division. Above all, they ought to actively pursue a plan to realize the compensation cost for training reserve forces. The non-standing reserve forces service system, which is currently continuously expanding, is applied to some mobilization positions within 30 days or 180 days for some mobilization-oriented units, and it is planned to expand to 4,593 including long-term and short-term systems by 2024[26]. However, as it is unavoidable to expand about 10 times by 2040, it is necessary to consider the expansion of the forward corps establishment unit, regional defense division, and reserve forces units in 2030 and to all reserve forces units in 2040.

In the Russo-Ukraine War, the Ukrainian citizens volunteered to conduct training and participate in the war. Regardless of age or sex, they trained with wooden guns and pushed forward with their will to resist. The wealthy purchased personal equipment with their own money and authenticated it on the social media, burning invigorating will to fight against invincibility. As seen in the current Ukraine crisis, the fighting is intensively carried out in the eastern and southern regions. If a war breaks out on the Korean Peninsula, it is likely to occur intensively in a certain area, as in Ukraine. In principle, the regional reserve forces are operated at the city, county, and district, and can be operated by switching to adjacent city, county, and district if necessary[27].

The U.S. ADOS system secures a budget in advance and lists and manages the reserve forces to ensure that the military can operate reserve forces when necessary. They are selected from among the ex-officers who have been discharged from the military, and according to individual wishes, they receive education and training for one day a year. The impact of the Ukrainian militia's will to resist during the Russo-Ukraine war on the implementation of the national all-out war should be taken as a lesson to establish a view of security for the entire nation and to strengthen its capabilities as a last resort in the wartime[28].

Under the national total defense system, the reform of reserve force advancement is not sufficient with the resources and efforts of the Ministry of National Defense. Now is the time to focus efforts on finding ways to make the reserve force advancement by integrating the resources of each governmental ministry[29]. In the Russo-Ukraine War, the reserve forces were mobilized to carry out the war as a national all-out war, but the unprepared reserve forces were not effective. It is important for the governmental ministry reserve forces personnel and defense reserve forces personnel to have the opportunity to have job training, agenda discovery, and joint seminars together[30]. A method of organizing reserve forces-related subjects in the bachelor's course in the military department of the university, and activating the reserve force research institutes of private universities such as the Sangmyung University Defense Reserve Forces Research Institute established in April 2021 to give research service tasks. In this context, it is necessary to form a consensus and joint efforts to make the reserve force advancement by forming a government-military-academia-research reserve force innovation council.

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7. Appendix

7.1. Author's contribution

	Initial name	Contribution
Lead Author	JY	-Set of concepts <input checked="" type="checkbox"/>
		-Design <input checked="" type="checkbox"/>
		-Getting results <input checked="" type="checkbox"/>
		-Analysis <input checked="" type="checkbox"/>
		-Make a significant contribution to collection <input checked="" type="checkbox"/>
		-Final approval of the paper <input checked="" type="checkbox"/>
Corresponding Author*	IB	-Corresponding <input checked="" type="checkbox"/>
		-Play a decisive role in modification <input checked="" type="checkbox"/>
		-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/>
		-Participants in Drafting and Revising Papers <input checked="" type="checkbox"/>
		-Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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Consideration Factors for Judging Situations in Combat: Focusing on Individual Combatants in Close Combat

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Abstract

Purpose: The purpose of this study is to derive the situational judgment considerations necessary to lead and creatively carry out the battle in close combat, where rational situational judgment of each combatant is very difficult.

Methods: In addition to literature studies, Delphi techniques were used for soldiers who participated in KCTC training, which is most similar to close combat, at least 20 times. Since 10 panels participated in the expert survey, the reliability problem of the Delphi survey process was not considered.

Results: The main results of this study are as follows. First, enemy, friendly state, dangerous area, concealing and concealing possible point, dominant point, immediate shooting possible state, timing, and engagement time were derived as factors for determining the situation of combatants in attack combat. Next, in defensive combat, the enemy's expected maneuver, the decisive battle area, the friendly situation, the weather and vision, the controllable point, the departure and conversion of positions, and the enemy and timing with great threats were derived.

Conclusion: This study was conducted to derive the situation judgment factors that each combatant should consider in order to be trained as combatants who think and judge by themselves so that combatants can make the fastest situation judgment in close combat, move before the enemy, and act immediately. To this end, a Delphi survey was conducted on KCTC training experts. As a result of the study, nine factors considering the situation in attack combat and eight factors considering the situation in defense battle were derived. It is desirable to find if the soldiers who are trained with these factors are more competent and positively contribute to the combat.

Keywords: KCTC(Korea Combat Training Center), Close Combat, Offensive Combat, Defensive Combat, Situational Judgment

1. Introduction

Looking at various wars, no matter how advanced weapons are, close combat between fighters is inevitable in actual combat. In particular, when there are many areas where mountainous terrain has developed and become urbanized, close combat at the level of small troops is inevitably more frequent. Because of the importance of this close combat capability, the Army is conducting shooting training for enemies within 100 meters and training at battlefields in the building and also teaching soldiers many lessons derived from many real battles so that soldiers can have close combat capabilities[1].

In particular, KCTC(Korea Combat Training Center), which is most similar to the actual battlefield, is stepping up efforts to wear Miles equipment and experience combat like the actual battle. Most units train a lot before coming to KCTC, but the same mistakes are always repeated.

Tactical aspects are also problematic, but when most battles take place within 100 meters, the leader(commander)'s command capability, each soldier's conditional reflex action, and the shooting capability are very inadequate. As a result, the training unit easily lose to the opposing forces, and questions are raised about whether they are learning actual combat capabilities[2]. This phenomenon is not only due to the lack of training and the leadership of the small unit commander, but also to the fact that individual combatants performing the battle do not know what factors to consider when judging the situation. Therefore, combatants react passively only to the command of the conductor without making a reasonable judgment. By looking at the way education and training of the current army is the basis of these problem mentioned above. Currently, education for each combatant is a form of repeated mastery of the procedure for performing combat, focusing on the action support for how to act[3].

Tactical considerations(METT+TC) that tactical units(corps to squad) must consider in order to carry out combat are mainly applied to commanders above squadrons[4]. Combatants who need to exercise their combat capabilities sensibly must analyze and judge information within close range in real time with their five senses and respond immediately. However, the situation judgment elements of individual combatants exist only empirically and are not theoretically systemized

Accordingly, this study aims to derive "combatant individual situation judgment factors" necessary to train combatants who can quickly and accurately judge situations even in battlefield environments where close combat is fierce and think creatively in line with mission-type command.

2. The Concept of Close Combat

It is necessary to look at the definition of close combat for better understanding . First, In terms of terms, close combat can be defined as 'a battle in a state of proximity to the enemy'[1] . Second, a close combat can be defined as 'a battle carried out in all types of battlefield and ground operations in a close area or at a distance that can directly affect the enemy'. Third, Field manual defines that it as "a battle carried out using light weapons, bayonets, and other heavy weapons at close distances, "a battle in the immediate vicinity of an operational area", and "a battle that takes place within the effective range of light weapons, including hand to hand fight". Putting these various definitions together, close combat is "a battle carried out using light weapons, bayonets, and heavy weapons at a distance where rifle direct fire is possible" [5][6].

Next, the situation of close combat is as follows. First, two-way units, which are hostile relations, must be in contact with each other. In other words, it refers to the time when both units are located within the transaction of the maximum distance among the direct fire machines held by both units. Second, at least one of the two units is not avoiding combat and is detecting the other in a state that is not penetrating. Third, units must have combat equipment that can damage the opposing unit as combat units, not non-combat units. Close combat is established when both units meet these conditions, and close combat includes direct shooting close combat and indirect shooting close combat[7].

Direct fire close combat is a battle carried out by a direct firearm such as a rifle, and indirect fire close combat is a battle carried out by a curved firearm such as artillery fire, and the damage caused by these battles can occur in various ways[8].

As seen above, close combat can be achieved only when quick judgment and action are made at a time when enemies and allies can face each other as human-to-human and cause direct damage.No matter how advanced science and technology are and how precise the battle is, it cannot be denied that the final victory or defeat of the battle is determined by close combat and hand-to-hand combat by small troops[9]. As can be seen in the Iraq War and the Afghani-

stan War, which declared that the U.S. military participated and won, close combat of the platoon continued to occur even after the end of the war. The importance of the future combat patterns will be further emphasized by more frequent and diverse small unit close combat, such as the Vietnam War in the past and the modern Iraq War[8].

3. The Judgment and Behavior of Combatants in Close Combat

It is the responsibility of the leader to judge and decide on the combat situation during the operation. In order to apply tactical principles, methods, and procedures creatively and flexibly in uncertain and fluid combat situations, the leader must always apply tactical considerations(METT+TC) to determine, resolve, and respond to the best situation[10]. Tactical consideration factor(METT+TC) is an essential consideration factor for leaders and staff to plan and implement operations in tactical units above the corps level. In close combat, the platoon leader or squad leader evaluates the situation in real time based on this[11].

Due to the nature of military organizations that have to act according to orders in urgent battlefield situations, the leader's judgment serves as the most important factor in determining the success or failure of the unit's mission[10].

Therefore, in an uncertain battlefield situation where it is difficult to predict exactly how the enemy will behave or how the situation will unfold, the leader closely evaluates the current situation according to the tactical consideration factor(METT+TC), decides, and [1].

The leader's tactical considerations have already been systematized and are appropriately used as a leader's situational evaluation factor from the corps to the squad, which is the spearhead of close combat, but there is no individual combatant's situational judgment factor. In a small unit battle situation that requires rapid decision and action, much of the situation judgment of combatants is excluded or only exists implicitly for the survival of individual combatants or colleagues.

Team units that have trained a lot can be seen to move more systematically according to the leader's intention, which repeats a lot of training and predicts more in advance and is operated organically according to the leader's intention or style. In other words, according to the leader's intention, an area that the combatant judges and moves on his or her own is created, and when it blends well with the leader's command and command area, the organization can fight as an organism[12].

Non-tactical combat cases, which appear due to poor judgment of the situation of combatants, are common not only in the past but also in the present. Many units train and prepare severely for combat, but the same error always appears in practical exercises such as the KCTC[13].

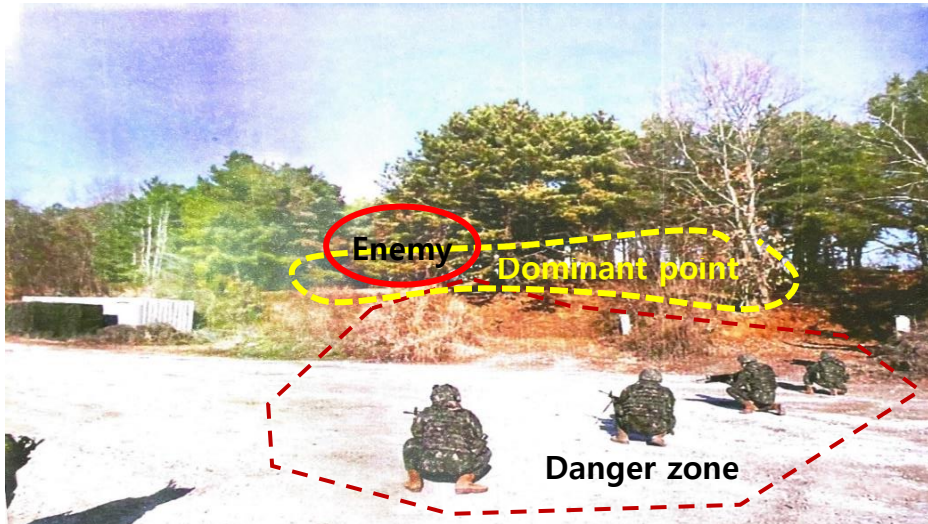
In particular, in combat situations where most battles take place within 100m, there is a lack of combat capability, such as lack of leadership ability, lack of conditional reflex action by each soldier, and lack of shooting ability in combat situations. As a result, there are growing calls for reviewing the education and training conducted by field units[14].

Currently, education for each combatant in the Army is a procedural repetitive mastery of combat performance, focusing on action guidelines on how to do combat actions. In other words, the main focus is to learn the combat performance procedure so that the individual's situation judgment element can be excluded according to the battlefield situation and move as it is according to the order[15].

Tactical considerations(METT+TC) that tactical units(corps to squad) must consider in order to carry out combat are mainly applied to commanders above squadrons. On the other hand, combatants sensibly exert their combat capabilities to analyze and judge information within short range in real time with their five senses and react immediately. Nevertheless, the necessary situational judgment factors are not only unclear in concept but also systematic, so training

is not properly conducted. Examples of non-tactical actions that appear during combat training without judging the situation of combatants appear in concealment, shooting, and mobilization that do not take into account enemies and topography[16].

Figure 1. Squad battle formation without considering enemy and terrain.



Another non-tactical behavior also appears in maintaining squad combat formation. The infantry squad is supposed to maintain and convert combat formation in consideration of missions, topography, and enemies when maneuvering. However, the combat formation described in the school record lacks flexibility in the location and spacing of combatants and is expressed in a fixed manner[17].

As a result, it can be seen that squad members are obsessed with the stereotype of maintaining formation and make non-tactical maneuvers such as securing a close control area to find the enemy first or avoiding terrain that may be exposed to the risk of direct fire from the enemy.

If the fighters' judgment from experience is not fully demonstrated, it may be difficult to exert combat power considering close combat situations in which they have to overpower the enemy and preserve our survival, especially considering the short combat distance within 100 meters of the mountainous Korean terrain. In the close combat of the platoon, an individual's immediate and rapid judgment of the situation can be seen as an essential factor for the organization's organic combat power and the success or failure of the operation [18].

4. The Process of Deriving Situational Judgment Factors

4.1. Definition of consideration factors

In order to cultivate the methodical knowledge(judgment power) necessary for mission-type combat performance, it is necessary to develop the ability to respond through immediate thought by deriving the situation judgment elements of individual combatants to be used immediately in the battlefield.

The combatant contextual consideration factor refers to the survival of not only combatants but also the unit's final combat mission by continuously and fastest in the process of acquiring and judging information within the three basic elements of battle(pia combat power, time, and space).

4.2. The process of deriving factors for contextual judgment

4.2.1. Subject of study

The subjects of this study are soldiers with at least 20 combat experiences at KCTC. The duration of the study subjects' military service, the number of KCTC combat experiences, and positions/duties at the time are as follows.

4.2.2. Research method

The Delphi method was used to derive the situation judgment element of the close combatant. This method is a method in which experts in the field agree on predictable or socially unconventional issues, and is considered a suitable method at this time when detailed research on the situation judgment factors of close combatants is insufficient.

According to previous studies, the number of expert panels can be at least 4 to 11, and the smaller the group, the more effective it is, Dalkey(1969) reported that the greater the number of panels, the greater the reliability. According to Anderson(1997), it was found that 10 to 15 people could obtain useful results only by small group experts, and Yoon Mi-sook(1999) said that at least 10 panels are needed to minimize average group errors and maximize group reliability(Ewing, 1990). In the study of Ziglio(1996), useful results can be obtained with only 10 to 15 panels. In this study, since 10 panels participated in the expert survey, the reliability problem of the Delphi survey process was not considered[19][20].

Delphi surveys were conducted step by step in the first and second rounds. The first question is asking for subjective opinions which were written as an open questionnaire, and the second was conducted as a closed questionnaire that evaluated the factors of consideration derived from the first questionnaire.

Through the first open survey, the factors considering the situation of close combatants were divided into attacks and defenses, and the second survey was conducted by synthesizing the factors written by experts. The use of overlapping or different terms in the first survey was summarized into 12 attack elements and 11 defense elements by summarizing the literature studies such as existing doctrines and combat cases, and three company leaders and platoon leaders with more than 30 combat experiences in KCTC. Considering the differences in the use of the same concepts or terms and the limitations in conceptualizing and expressing empirical parts considering the academic research ability/education of experts, the second survey was conducted. This is to abbreviate into key elements rather than broad and diverse[21][22][23].

The second survey was conducted by conceptualizing the answers to the first open-ended questionnaire. The contents of the responses are shown in <Table 1> and <Table 2>. The second Delphi confirmed the level of expert agreement on the survey results obtained through the first Delphi. Whether the response results of expert panels are converging can be examined by consensus¹[24][25].

¹ The Degree of consensus is a method of verifying how much consensus between respondents was reached by modifying the values between Q₃(75th percentile) and Q₁(25th percentile) using the quartile range and the median value(Kim Hak-beom, 2005).

The degree of agreement can be obtained by $1 - \frac{Q_3 - Q_1}{Mdn}$ (Q₃ - Q₁ : quaternary range, Mdn : central value), a degree of agreement from 0 to 1 is extracted, and the closer to 1, the higher the degree of agreement(Kwon Tae-il, 2009).

Table 1. Factors to consider for situation judgment of close combatants(offense).

Consideration factor	Content(definition)
Enemy	<ul style="list-style-type: none"> • Enemy characteristics like the scale and arrangement that combatants must detect and capture in the current battlefield
Friendly force situation	<ul style="list-style-type: none"> • My close allies' positions and combat capabilities(available weapons, timing, damage conditions), which can directly affect the battle, including myself
Danger zone	<ul style="list-style-type: none"> • Areas where an enemy is expected to be present or identified, or areas where it is deemed to be damaged by enemy close-range shots, such as direct fire and curved fire extinguishers
Maneuvering routes	<ul style="list-style-type: none"> • Maneuvering routes that ensure ally survivability, stealth, and access to enemies
Cover and concealable point	<ul style="list-style-type: none"> • Topographic features that can ensure survival from enemies and effectively eliminate enemies
Dominant point	<ul style="list-style-type: none"> • Areas(points) that must be secured first in order to preserve survivability from predicted or identified enemies and create favorable conditions for allies when maneuvering or engaging
Immediate shooting state	<ul style="list-style-type: none"> • Cognitive, psychological, and physical readiness, such as firearms capable of shooting quickly and the thoughts and body posture of the shooter.
Obstacle	<ul style="list-style-type: none"> • Enemy artifacts that limit ally's survivability and mobility.
Timing	<ul style="list-style-type: none"> • The most appropriate time and opportunity for combatants to take action based on situational judgment
Movement and enemy suppression speed	<ul style="list-style-type: none"> • Maneuvering and engagement speed that minimizes the time the enemy can identify and inflict damage to allies
Engagement time (minimum)	<ul style="list-style-type: none"> • Decide whether to continue or avoid the engagement by considering the mission and end goal or comparing the combat power of the enemy and allies.
Weather conditions	<ul style="list-style-type: none"> • Circumstances(day/night, fog, rain, etc.) that may have a favorable or unfavorable effect upon engagement

Table 2. Factors to consider in determining the situation of close combatants(defense).

Consideration factor	Content(definition)
Anticipated enemy-avenue of approach	<ul style="list-style-type: none"> • The attack maneuver routes of the enemy within the area of responsibility that must be acquired through the five senses or intelligence of higher command
Decisive battle zone	<ul style="list-style-type: none"> • The area that is most susceptible to fatal damage to the enemy according to the enemy's actual maneuvering path

Combat procedure (method)	<ul style="list-style-type: none"> Advanced unit firepower plan based on enemy attack patterns, firearms and obstacles linked to neighboring allies, and operational plan for advanced unit firepower
Friendly force situation	<ul style="list-style-type: none"> Location and combat status of senior and neighboring allies
Weather and field of view	<ul style="list-style-type: none"> Outline conditions(day/night, fog, rain, etc.) that influence the enemy's attempt
Dominant surveillance areas/unable areas	<ul style="list-style-type: none"> Areas that can be controlled by surveillance or obstacles among the areas of responsibility within the defensive positions, areas that cannot be controlled and require additional cooperation or action
Line of displacement	<ul style="list-style-type: none"> Enemy reach line for determining departure and transition from a fixed position to an agreed position in the event that the defense is restricted by enemy attacks
Enemy with great threat	<ul style="list-style-type: none"> Friendly or most threatening enemy in the surveillance zone
Timing	<ul style="list-style-type: none"> Time to engage in coordinated defense against attacking enemies, such as reporting/shooting times and departure from position, or to engage in combat actions to ensure their viability
Retreat routes	<ul style="list-style-type: none"> A maneuver that can secretly leave to ensure future movement or viability
Mission	<ul style="list-style-type: none"> Purpose of conducting combat at assigned locations and roles, such as local alert units or flyers

Secondary Delphi calculated the validity of the above elements using the number of experts who gave 4 or more points using a 5-point scale. Based on Lawshe's(1975) theory, the degree of consensus was obtained as a Content Validity Ratio(CVR), and elements that are CVR .62 or higher and satisfy an average of 4.0 or higher were adopted. Among them, elements showing a slight difference from CVR .62 were adopted or rejected after doctrinal review and discussions with experts and researchers in consideration of their conceptual significance. In addition, SD(standard deviation) and degree of consensus were judged as verification data and referenced[26].

5. Results of Consideration of Factors

The results of Delphi survey analysis on the factors considering the situation of combatants are as follows.

Table 3. Necessity of consideration for determining combatants' conditions in offensive operations.

Distinction	M	SO	CVR	Degree of agreement
Enemy	4.80	.422	1.00	.960

Friendly force situation	4.60	.699	.800	.800
Danger zone	4.30	.483	1.00	.750
Maneuvering routes	4.60	.699	.800	.800
Cover and concealable point	4.10	.738	.600	.687
Dominant point	4.20	1.229	.800	.777
Immediate shooting state	4.10	.738	.600	.687
Obstacle	3.80	.789	.200	.687
Timing	4.20	.919	.400	.555
Movement and enemy suppression speed	4.30	.949	.400	.600
Engagement time (minimum)	4.20	.789	.600	.687
Weather conditions	4.00	.816	.400	.500

As factors for consideration of combatants' situational judgment during offensive operations, those that satisfy an average of 4.0 or higher and a CVR of .62 or higher were found to be enemies, friendly force situation, dangerous areas, maneuver routes, and dominant point. It can be seen that the first thing that combatants should consider during the joint operation is the location and condition of the enemy, the geographical danger zone considering the enemy, and the maneuver routes that ensures its viability and does not expose the airway. Factors that slightly fell short of the CVR .62 were the cover and concealable point, immediate shooting state, and movement and enemy suppression speed.

These factors are factors that must be considered during engagement, and when experts consider the factors, they seem to have underestimated the necessity of factors to be considered during engagement because they are engaged after starting → contact. Therefore, it is necessary to derive the factors to consider for situation judgment by dividing it into maneuvers and engagements. Non-adopted factors included obstacles, timing, maneuvering and enemy suppression speed, and weather condition. Obstacles are important factors that can inflict damage to allies, but they are not only given priority over enemy direct firearms or surveillance, but also seem to be judged as factors to be overcome when confronted with the exception of booby traps or land mines.

Timing was considered a very important factor by this researcher, and the question of whether individual combatants judge the timing of combat action or shooting is also related to the commander's command, and experts are part of executive, but it seems that opinions varied. Since it is not a factor that should be judged primarily as an external factor, but rather as it is a

part of deciding whether to devise my actions after information judgment, there are many parts that need to be considered which mission, commander's intent, survival or scarcity of opportunity rather than always. However, it can be seen as an essential element when reflecting the research purpose that the researcher derives the judgment factors of the combatants, and that the combatants should think for themselves and give them some right to decide their actions. The speed of maneuver and enemy suppression is similar to the maintenance of attack momentum, which is the rule of attack tactics, but the tactical part or the part that needs to be determined considering the task can be seen as the conductor's judgment, it can be low validity. Weather condition is also an important factor in METT-TC, especially in terms of combat readiness or covert maneuver, but it seems to have been somewhat less necessary to consider and judge in real time because it is already an environmental factor given to individual combatants[27].

The necessity of consideration factors for judging the situation of combatants in defensive operations is as follows.

Table 4. Necessity of consideration for determining combatants' conditions in defensive operations.

Distinction	M	SO	CVR	Degree of agreement
Anticipated enemy-avenue of approach	4.40	.699	.800	.777
Decisive battle zone	4.70	.675	.800	.950
Combat procedures (methods)	4.00	1.33	.400	.555
Friendly force situation	4.60	.516	1.00	.800
Weather and field of view	4.80	.422	1.00	.950
Dominant surveillance areas/ unable areas	4.50	.527	1.00	.777
Line of displacement	4.10	.568	.800	.937
Enemy with great threat	4.00	.816	.800	.937
Timing	4.40	.699	.800	.777
Retreat routes	4.20	.789	.600	.687
Mission	4.20	.789	.600	.687

The factors that satisfy the average of 4.0, CVR.62 or higher were considered anticipated enemy-avenue of approach, decisive battle zone, friendly force situation, weather and field of

view dominant surveillance areas/unable areas, line of displacement, a threatening enemy and timing. As for the anticipated enemy-avenue of approach, it can be said to be the most important factor in determining the direction of firearms and the location of obstacles within the area of my defense responsibility. Decisive battle zone is average of 4.7 and the agreement is high at .950. It is important to monitor real-time enemies in order to determine how to fight with the enemy's expected firearms and obstacles. Friendly force situation also showed a high consensus of 4.6 on average and CVR 1.00, which seems to have been cited as an important factor because defense is a fight with dynamically moving enemies in a static state, and if we do not engage in coordinated combat with our troops, the defense line will collapse. Unlike attacks, weather and field of view have been adopted as important factors in defense. It is important factor to consider for operational success, as they can affect combatants who must always be wary of certain places by having a great mental, physical impact. Dominant surveillance areas and unable areas can also be seen as having a similar effect to weather and field of view. Line of displacement, it is not currently doctrinal for combatants to decide whether to leave or change positions without the commander's approval, but the enemy's advance line and our fighting power should be considered what determines the transition from a static state to a dynamic state for combatants survival. This is sometimes judged in engagement, and in the case of a local border unit, it is also a part to consider when determining that the position must be changed even when the enemy moves to a place other than the expected area. Enemy with great threat is the most threatening enemy in the area of responsibility between battles in defensive combat, which will cause great damage to allies or become a major operational obstacle, which must be destroyed in consideration of enemy priorities.

Unlike offensive combat, timing is considered a necessary factor in defensive combat, but unlike dynamic attack operations, action constraints can be imposed, it seems necessary to continuously think about when to cause great damage to the attacking enemy with cooperative defense such as report, shooting and displacement or when to take combat action to ensure survival. Retreat maneuver and missions were considered somewhat below the standard with an average of 4.2 CVR.600, but the task of defending the responsible area seems to be low in importance because the responsible area remains unchanged even if operational situations such as displacement, decisive battle area are changed. Retreat is also an important factor for viability in the case of a position change, but rather than a judgment factor, it is judged that it was considered a maneuver to be initiated between the group's defense operations to continuously damage the enemy when changing the decisive battle area.

Researchers integrated and embodied the concepts by considering above the contents.

The concept of terrain or region is specifically conceptualized using terms such as points and status in consideration of the perspective of individual combatants, and the term time is literally expressed as a foreign word expression of timing in order to describe a more instantaneous and opportunistic concept. Other comprehensive concepts such as enemies, troops, and weather are also expressed as concepts that are relative to the enemy and immediately recognizable with five senses so that individuals could recognize the concepts as information at the battlefield.

The factors to consider for determining close combat are as follows.

Table 5. Combatants close combat situation judgement considerations.

Consideration factor	Content(definition)
Defensive operations	
Enemy	<ul style="list-style-type: none"> • The size, deployment, and combat power of the enemy that combatants must detect and capture in the battlefield
Friendly force status	<ul style="list-style-type: none"> • The position and combat power of close allies that can directly affect the battle, including oneself (available firearms, morale , damage conditions)

Danger zone	<ul style="list-style-type: none"> • Areas where an enemy is expected to be present or identified, or areas where it is deemed to be damaged by enemy close-range shots, such as direct fire and curved fire extinguishers
Maneuvering routes	<ul style="list-style-type: none"> • Maneuvering routes that ensure ally survivability, stealth, and access to enemies
Cover and concealable point	<ul style="list-style-type: none"> • Topographic features that can ensure survival from enemies and effectively eliminate enemies
Dominant point	<ul style="list-style-type: none"> • Areas(points) that must be secured first in order to preserve survivability from predicted or identified enemies and create favorable conditions for allies when maneuvering or engaging
Immediate shooting state	<ul style="list-style-type: none"> • Cognitive, psychological, and physical readiness, such as firearms capable of shooting quickly and the thoughts and body posture of the shooter.
Timing	<ul style="list-style-type: none"> • The most appropriate time and opportunity for a combatant to take action immediately or under the command of the commander through an inter-battle situation judgment
Engagement time (minimum)	<ul style="list-style-type: none"> • Engagement or avoidance is determined by comparing each forces and considering the mission & final objective.
Defensive operations	
Anticipated enemy-avenue of approach	<ul style="list-style-type: none"> • The enemy's attack maneuver within the responsible area to be acquired through five sense and the intelligence of superior units, such as enemy activities, movement routes, etc
Decisive battle zone	<ul style="list-style-type: none"> • The area that is most susceptible to fatal damage to the enemy according to the enemy's actual maneuvering path.
Combat procedure (method)	<ul style="list-style-type: none"> • Advanced unit firepower plan based on enemy attack patterns, firearms and obstacles linked to neighboring allies, and operational plan for advanced unit firepower
Friendly force situation	<ul style="list-style-type: none"> • Location and combat situation of superior and adjacent troops
Weather and field of view	<ul style="list-style-type: none"> • Outline conditions affecting the identification of enemy intention(day, night, fog, rain, etc.)
Dominant surveillance areas/unable areas	<ul style="list-style-type: none"> • Areas that can be controlled by surveillance or obstacles among the areas of responsibility within the defensive positions, and areas where additional cooperation or measures are required due to lack of control
Line of displacement	<ul style="list-style-type: none"> • If the defense is restricted from a fixed position because of an enemy attack, the evacuation or transition is determined to an pre-agreed point
Enemy with great threat	<ul style="list-style-type: none"> • Enemy in the surveillance zone that poses the greatest threat to our friendlies or to me
Timing	<ul style="list-style-type: none"> • Time to engage in coordinated defense against attacking enemies, such as reporting/shooting times and departure from position or when combat action is to be taken to ensure their survival

6. Conclusion

This study derived situation judgement considerations to be applied to individual combatants in order to become combatants who move and judge themselves earlier than the enemy and immediately engage in combat action[28]. To this end, Delphi survey method was conducted on scientific combat training experts who train practically and the investigation is related to the factors that combatants should think about and judge in attack and defense battles, respectively.

As a result of the study, enemy, friendly force status, danger zone, Maneuvering routes, cover & concealable point, dominant point, immediate shooting state, timing, engagement time were derived in offensive operations. Anticipated enemy-avenue of approach, decisive battle zone, combat procedure(Method), friendly force situation, weather and field of view, dominant surveillance areas/unable areas, line of displacement, enemy with great threat and timing were derived in defensive operations[29]. These factors are situational judgment elements so that combatants can immediately acquire information with their five senses at the battlefield, derive

and judge secondary information, and lead to action[30][31].

Thinking combatants and warriors are always insufficient in combat training, so they should study and master what needs to be supplemented[32]. In particular, special forces in which each combatant performs a solo mission on a highly trained unit or team basis can think, judge, and act on their own through high-level training. Not only special forces but also field soldiers who have trained a lot such as corporals and sergeants think and act on their own roles, provide important judgment elements to squad leaders or platoon leaders, and fill gaps in the command ability and leadership with their thoughts and actions in order to achieve decisive operational success[33].

A series of tactical combat actions that preserve the survival of our squad by immediately firing and occupying the highlands are not conducted by the conductor in words or signals, but by the fighters themselves through training. The judgment and behavior of combatants are the authority of the commander, and it is the story of a person who has not experienced combat to take issue with the command capabilities because each combatant can not control the behavior of each combatant in a combat situation. Within the highly trained small sized units like platoon or squad, the leader and the members implicitly acknowledge and share each other's thoughts and actions, and when this is achieved, command is made with only one simple expression, and hand signal, and mission command between the commander and combatants is possible.

Currently, soldier's training mainly consists of acquiring basic combat skills through maintaining combat formation and signal familiarity within the squad and platoon, and focusing on action tips and procedures. But doing only these trainings make soldiers who can be easily panicked in unexpected situations, and even the commander is panicked and unable to command. At a time when individual combat capabilities are more important due to close-quarters combat and acceleration of urbanization, combatants must be trained to achieve missions through their instinct with judgment factors to think for themselves. The commander should train together to lead the battle to victory by directing the individual's thoughts and judgments, not the combat command that controls the movements and actions of the individual combatants[34].

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8. Appendix

8.1. Authors contribution

	Initial name	Contribution
Lead Author	YK	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/>
Corresponding Author*	DL	-Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/>
Co-Author	BK	-Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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A Study on the Improvement of Laws for the Development of National Defense and Space Power -Focused on Space Development Promotion Act-

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Abstract

Purpose: Recently, all countries of the world recognize space as an important area for military operations in modern warfare and are accelerating the space development. Especially countries in Northeast Asia including China and Japan are strengthening their space power, and space power is expected to be an important element in future warfare. Korea is also developing space technology and expanding its space activities as a member country of Space Club following the launch of NURI in 2022. Accordingly, it is necessary to prepare the foundation for utilizing the space with the military purpose step-by-step to prepare for the future warfare.

Methods: Legal and institutional preparations should precede by using understanding and utilization of space of international community, especially those of advanced countries in space. This is because our space-related laws tends to see the space as a subject for scientific technology and the importance of security for the military use of space does not reflected. Therefore, the necessity for organic and practical cooperations between related agencies for the early establishment of defense space power and legal and institutional maintenance that supports ever-growing space technology are required.

Results: Ministry of National Defense will prepare 「Master plan for the development of defense space power」 and establish the defense space power based on it. However, the progress of 425 project has been delayed due to the different view of existing statue and government departments given that the trend of the urgency of strengthening defense space power, development of nuclear and missile of North Korea, space development of all countries over the world and strengthening of space forces. It is possible to promote to strengthen the defense space power by existing legal system, but there are many restrictive elements. We can consider enacting a special law related to defense space basically to overcome the existing legal system, but there is no agreement among relevant agencies and there is high possibility for criticism on militarization of the space by international community.

Conclusion: Therefore, it is necessary to promote the chairman of National commission on Space to at least Prime Minister and give full authority of the Minister of Defense on security and defense space through the amendment of current laws such as Space Development Promotion Act, Defense Acquisition Program Act, Act on the Organization of National Armed Forces and Aerospace Industry Promotion Act. And it should be noted that it is necessary to develop into activities that are not opposed to international law and the justification of the peaceful use of the space by international community.

Keywords: Peaceful and Military Use of Space, Space Development, Defense Space Power, National Commission on Space, Suitability of System

1. Background of and Need for Review

1.1. Background of the review

If the 19th century were the era in which we ruled the sea, and the sky until the 20th century, the 'space age' has advented where the universe must be ruled in the future. From the space activities led by the state, private space activities are expanding with a focus on advanced space countries. In terms of the outer appearance, it seems to be a peaceful and commercial use of space. Yet in reality, space is used militarily for their own benefit, or peaceful and commercial use of space may be converted into the military use.

We must face the fact that space has become an object of military use, from the scientific exploration to the commercial use. Under the customary international law of 'peaceful use of space', the international community understands that the 'military use of space with non-aggressive intent' is inclusive.

As a member nation of the Space Club following the launch of Nuri in 2022, the Republic of Korea is currently in the process of developing space technology and expanding its space activities. The legal and institutional preparations ought to be sufficiently preceded by taking as an example the understanding and utilization of space in the international community, especially for and by the advanced space countries. The Korean space related laws take on such a strong view of space as an object of science and technology, yet the importance of security for the military use of space has not been reflected[1].

1.2. Need for the review

Recently, countries around the globe have recognized outer space as an important area of military operation in the modern warfare, and are accelerating their space development. In particular, in Northeast Asia, the countries including China and Japan are strengthening their space power, and it is expected that the space power will become an important factor in the future warfare. Accordingly, Korea also needs to prepare for the future warfare by preparing a step-by-step basis for the military use of space.

The Ministry of National Defense seeks to prepare the "Basic Plan for Defense and Space Power Development" and build the defense space power based on it. In particular, North Korea's nuclear tests and missile launches, as well as the development of the defense and space capabilities by China and Japan, operate as a significant threat to the security of the Korean Peninsula and, at the same time, destroy the balance of power given the asymmetric forces.

It is urgent to build a defense space force in order to prepare for the significant security threat surrounding the Korean Peninsula and acquire the information in advance and secure the precise response capabilities. It is also urgent to deploy a reconnaissance satellite and an independent early warning satellite in preparation for North Korea's nuclear and missile launch as a surveillance and reconnaissance force capable of the early detection of the movement of North Korea's mobile missile launchers. Furthermore, it is urgently needed to establish a military utilization plan for the Korean-styled independent navigation satellites, which are reflected in the mid- to long-term national space development plan.

Considering the fact that the international space law is stagnant compared to the space development and expansion of space activities, the promotion and management of space activities via the domestic law has increasingly become important, and such space activities may maximize the Korean interests in accordance with the international law. Furthermore, the development of the domestic space law will play a positive role in the formation of the international space law while promoting the use of space. It derives the requirements for the organic and substantive cooperation among the related institutions for the early construction of the defense space power and for the establishment of laws and systems to support the ever evolving space technology[2].

2. Defense and Space Policies of Advanced Space Countries

2.1. The United States

The National Aeronautics and Space Act 1958 is the framework law on the scope and discipline of aerospace activities, which states the need and stipulates that the weapons system development, military activities and the activities needed for the national defense are under the responsibility and guidance of the Ministry of National Defense. Section 102d(6) of the Act refers to the military use of results obtained from space activities as a national goal to be achieved via the U.S. aerospace activities and grants the Department of Defense the preferential access to the information of military value and importance. Article 203(c) 12 grants the NASA the authority to cooperate with the dispatch of military personnel of the Army, Navy, Air Force, and Marine Corps and conclude agreements, while the Land Remote Sensing Policy 1992 specifies that the Ministry of National Defense takes the initiative in remote sensing.

The US space security strategy is to prevent and deter threats from the space power while maintaining the US leadership in space, and improve the space capabilities via international cooperation. The Strategic Command(Space Commands of all forces were integrated on October 1, 2012) that conducts space operations under the Department of Defense, the National Reconnaissance Office(NRO) in charge of the space-based information, and the Defense Advanced Research Projects Agency(DARPA) in charge of research and development related to space or missiles and the Ballistic Missile Defense Research Institute(BMDO), etc. In particular, the NRO is responsible for the production and operation of intelligence satellites, and provides the image information and signal information collected to the National Security Agency(NSA) under the Department of Defense and the Central Intelligence Agency(CIA)[\[3\]](#)[\[4\]](#).

2.2. Russia

Among the two largest space powers along with the United States in the past, Russia has maintained its national status based on the use of space since the 2000s, actively promotes space development, and places significant importance on the military value of space. Currently, the air force, air defense force, and anti-aircraft missile force are integrated into the aerospace force to improve the efficiency of the aerospace military force, and early warning, optical reconnaissance, navigation and communication satellites are used for the military purposes.

The Law of the Russian Federation “About Space Activity” mandates that the space activities for non-military purposes be performed by the Space Agency, and Article 7 provides that the space activities for defense and security purposes be performed by the Minister of Defense, and the Minister of Defense is required to implement plans to develop and use the military space technology in conjunction with other ministries[\[5\]](#).

2.3. China

The People's Liberation Army is leading China's space development, and the final decision on all forms of space development lies with the military. China's space expansion against the monopolistic U.S. space domination has begun by launching a manned spacecraft, successfully intercepting satellites with ballistic missiles, promoting the establishment of a satellite navigation system, promoting the establishment of a space force, and promoting the manned lunar exploration[\[6\]](#).

2.4. Japan

According to the Peace Constitution, the peaceful use of space was understood as intended for the non-military use. By defining it, Japan is preparing the foundation for the military use of the space with a non-aggressive and defensive character from the perspective of the demilitarization of the universe. Accordingly, reconnaissance satellites are already in possession, and

the early warning satellites and independent satellite navigation systems are making progress in possession, while the JAXA, which was integrated in 2003, oversees the space-related R&D.

Established in accordance with the Framework Act on Space, the Space Development Strategy Headquarters oversees the space development, including the promotion of the space industry and defense purposes, and the head of the headquarters has been elevated to the Prime Minister. All ministers of state participate in this and the Prime Minister is leading it. Considering the position of the Prime Minister or Chancellor under the parliamentary cabinet system, Japan's space policy promotion system has significant implications[7][8].

3. Requirement for the Enactment and Amendment of Korean Laws for the Defense and Space Power Development

3.1. Space development promotion act

The Act is playing the role of the framework law on space activities, and it is realistically more effective to find ways to improve the space and take on the form of amendment rather than enacting the new special law in the form of a new special law(which recently has been amended and enforced on November 11, 2021 and April 21, 2022).

While the space development requires a comprehensive and balanced consideration of the national security and other factors as well as the scientific and technological perspectives, the position(role) of the President or Prime Minister is not specified, and the Minister of Defense has a very little involvement. In the sense that the initiative under the Act lies with the Minister of Science, Technology and Information and Communication(who is not the Deputy Prime Minister, yet a member of the State Council of the same level), it does not align with the system of governance under the Constitution and the Government Organization Act. In particular, the fact that the Ministry of Science and ICT has the initiative in space development is an issue when considering the comparative legal reality that the Ministry of Defense and the military are in charge of an important axis of space development as a result of advanced space countries considering the national security. After the enactment of the same law, it has undergone some amendments except for the amendment of other laws, rendering the legislative system still insufficient given the name of the 8th.

As a consideration for the amendment, ①the space development with specific validity by giving priority to the required ministries, rather than just consulting with the required ministries in the use of satellite information, securing and promoting the budget for related space development projects, etc., must be made possible. ②Considering the fact that the Space Committee deals with national strategic issues rather than making the Space Committee an externally direct body of the President and the Minister of Science, ICT and Future Planning is the chairperson, it must be changed to the affiliation of the Prime Minister, which may be effectively adjusted and supported, and the chairperson must be changed to the Prime Minister, and the Prime Minister should take on the responsibility of making timely and reasonable space development possible for the relevant ministries, which has been reflected in the recent amendment.

As the Chairman of the National Space Committee, the Minister of Science and ICT is not in the position of a Deputy Prime Minister, but only in a position on the same level as the heads of relevant administrative departments, and hence, there are fundamental limitations in coordinating diverse and flexible space development. In particular, it is difficult to coordinate the National Security Agency with the Ministry of Defense, the central administrative agency for national security purposes. It is legitimate. ③Furthermore, in view of the trend of space powers maximizing their national interests through military use while observing the principle of peaceful use of space, the Ministry of Science, Technology and Information and Communication is the

main ministry, and given which, considering space only as an object of scientific exploration and for the security purposes excluding private space development might delay the use of space for security purposes.

However, while maintaining the legislative structure to use space peacefully, it is necessary to lay the groundwork for the Ministry of Defense's space development in the security related areas, so that the possibility of military use is not directly revealed. ④The amendment of the formula to determine that the Minister of Defense has authority in connection with national security or to exclude the application of this Act might excessively allow exceptions under the jurisdiction of the competent ministries, thereby undermine the purpose of the legislation, considering that the legislative purpose of the current Space Development Promotion Act is to promote the peaceful use of space through systematic promotion of space development[9].

3.2. United defense act

According to Article 4 of the same law, Paragraph 1 stipulates that the central united defense council shall be established under the jurisdiction of the Prime Minister. Paragraph 2 also provided that the chairman of the Central Council is the Prime Minister, and the members are the Minister of Foreign Affairs, Minister of Unification, Minister of Justice, Minister of Defense, Minister of the Interior and Safety, Minister of Culture, Sports and Tourism, Minister of Agriculture, Food and Rural Affairs, Minister of Trade, Industry and Energy, Minister of Health and Welfare, Minister of Environment, Minister of Employment and Labor, Minister of Gender Equality and Family, Minister of Land, Infrastructure and Transport, Minister of Oceans and Fisheries, Minister of SMEs and Startups, Minister of Government Policy Coordination, Minister of Veterans Affairs, Minister of Legislation, Minister of Food and Drug Safety, Director of the National Intelligence Service and the head of the United Defense Headquarters, and other persons prescribed by the Presidential Decree.

According to the same law, the central united defense council under the Prime Minister's office and the chairperson becomes the Prime Minister, and hence, it is in line with the fact that it is reasonable to make the National Space Committee under the direct control of the Prime Minister and change the chairperson to the Prime Minister in the need for amendment of the Space Development Promotion Act. In the future, the universe will also become the battlefield of the nations, and naturally, it will be embraced by the concept of united defense. Since the head of the united defense headquarters is the Chairman of the Joint Chiefs of Staff, it is natural to give the Minister of Defense, who has military authority, and the Chairman of the Joint Chiefs of Staff, who has military authority, the key involvement in space, which will become the realm of future battlefield for nations.

According to the text of the law, just because an organization belongs to the President or belongs to the Prime Minister, the chairperson of the committee does not necessarily become the President or the Prime Minister. In the case of the Act on the Sustainable Use of Dokdo, the Prime Minister serves as the chairman of the Dokdo Sustainable Use Committee for the organic cooperation and coordination among the related central administrative agencies and local governments.

Table 1. Article 15 of united defense act.

Now	Amendment direction
Aarticle 15(united defense operations) (1) United defense operation zones shall be classified as follows: 33. Air zone: prohibited airspace and ordinary airspace.	Aarticle 15(united defense operations) (1) United defense operation zones shall be classified as follows: 33. Air zone: prohibited airspace and ordinary airspace, outer space.

3.3. Defense acquisition program act

Under the same Act, it is possible to pursue a defense acquisition program such as the development of satellites for military purposes, but it is necessary to make the basis for development easier by adding space power such as satellites to the weapons system. However, it is possible to choose whether to adopt an insertion method for the Act or supplement it with the Enforcement Decree of the Act thereunder.

Since military purposed satellite development is also a space development project, it is possible to secure the satellites through the procedures stipulated by the Space Development Promotion Act. However, if the military desires to develop and secure it in a timely manner according to the needs desired by the military, it may be considered to insert a special regulation as the same Act has the status of a special law with respect to the Space Development Promotion Act, a general law.

In order to more easily develop satellites for defense and military purposes, it is more preferable to add satellites to the enforcement ordinance of the Act through review by the State Council. This is because it is not appropriate for the law to directly reveal the will to use space for military purposes through the provision of securing satellites for the military purposes.

As it is considered that only minor matters stipulated by the Presidential Decree are stipulated for the omission of review by the Space Committee under the Space Development Promotion Act, it is more special under the Defense Acquisition Program Act than expanding the exceptions by adding the review omissions of the Space Committee under the Space Development Promotion Act, and hence, is appropriate to provide flexibility through the insertion of regulations (addition of consideration by the Defense Acquisition Program Promotion Committee instead of reporting to the Prime Minister and omitting the review by the Space Committee on the development of satellites for military purposes). This is because Article 4 of the same Act stipulates that the defense acquisition program is governed by this Act, except where there are special provisions under other laws.

3.4. Act on the organization of the Republic of Korea armed forces

If the Korean space activities, such as a leap in space launch vehicle technology and securing military satellites, increase exponentially, a change in the organization of the armed forces targeting space is expected. Through the amendment of the law, the existing military types of the Army, Navy (including the Marines), and the Air Force may be expanded to add the new types of military service, such as the Strategic Army or the Space Force.

Under the premise that the Korean space activities will make a dramatic leap in the Korean space activities because the armed forces are organized in terms of the army, navy, and air force (hereinafter referred to as "each force") in accordance with Article 2 Paragraph 1, new types of soldiers in the Strategic Army or Space Force are added or integrated with the air force. Hence, it may be reorganized into a military class of the Aerospace Army.

Alternatively, when needed for the military purposes pursuant to Article 2(3), joint units and other necessary institutions may be established under the command and supervision of the Minister of Defense as prescribed by the Presidential Decree. Hence, upon receiving the delegation of the above, a joint unit under the command and supervision of the Minister of Defense rather than the Chairman of the Joint Chiefs of Staff may be established in the form of a Presidential Decree.

Korea, which is faced with different realities from those of such space powers as the United States, Russia, and China, is more legitimate to prepare for the space activities such as space monitoring through satellites by establishing a joint unit through the enactment of a Presidential decree rather than adding or reorganizing a separate military class. An external display of active military activities will never yield any benefit given the security realities of Northeast Asia.

3.5. Whether a special law governing satellites is enacted

Mindful of the fact that Korea is a model peacemaker in the international community and that it promotes the peaceful use of outer space by adhering to the space related conventions and treaties executed by the Republic of Korea with other countries and international organizations in accordance with Article 3 of the Space Development Promotion Act, and even if the military use is won over towards the peaceful use as long as it is non-aggressive, it is not desirable to attempt a military use in the face of the international community. However, the structure of the existing Space Development Promotion Act emphasizes only the purely peaceful use of space such as scientific exploration, excluding the possibility of military use of space, and does not sufficiently consider the space activities of neighboring space powers. Hence, it is natural to secure the national security by securing independent military satellites, etc., and promote the maximization of the Korean interests as permitted by the International Space Act.

As noted in the above, the Space Development Promotion Act and the Defense Acquisition Program Act should be amended to be more Ministry of Defense friendly, and at the same time, the United Defense Act and related laws such as the Armed Forces Organization Act should be taken into consideration with priority, and there should be no confusion in the legislative system on space activities through the enactment of a special law that governs only the satellites[10][11][12][13][14][15][16][17][18].

3.6. Whether the space framework act is enacted

The discussions of the enactment of the Space Framework Act seem to have been stimulated by the fact that the Space Development Promotion Act did not fully fulfill the function of the general law on the space activities and Japan, a space power, enacted the Space Framework Act. In the legislative process, it is very difficult to enact a new special law, and while the Space Development Promotion Act is playing the role of a general law, it is desirable in reality and legislatively further support Korea's space activities through the reasonable amendment of the law.

However, the legislative structure that prioritizes the peaceful use of space under the Space Development Promotion Act must be maintained, and the space activities for defense and security purposes must be fully considered without harming them, and the preferential authority of the Minister of Defense must be secured. This method offers the systematic synthesis in terms of the structure of the international space law and the existing space related Korean laws[19][20][21][22][23][24][25].

4. Conclusion

Considering the stagnation of space international law, regulation and management of space activities can be important through domestic law, and the development of space domestic law will play a positive role in the formation of space international law while promoting the use of space. Military use of space is understood as peaceful use, and given the urgency of strengthening defense space, North Korea's nuclear and missile development, space development, and space military strengthening trends around the world, existing legislation can push for strengthening defense space, but there are many constraints.

The revision to upgrade the chairman of the National Space Commission to the prime minister is reasonable because there is no consultation among related agencies and there is a high possibility of criticism over the international community's militarization of space.

The current laws, such as the Space Development Promotion Act, the Defense Acquisition Program Act, the Armed Forces Organization Act, and the Aerospace Industries Promotion Act need to be inserted and revised to give the Minister of Defense full authority, but it needs to

be carried out as an activity that is not opposed to international law and the cause of peaceful use of space.

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6. Appendix

6.1. Author's contribution

	Initial name	Contribution
Author	DN	-Set of concepts <input checked="" type="checkbox"/> -Design <input checked="" type="checkbox"/> -Getting results <input checked="" type="checkbox"/> -Analysis <input checked="" type="checkbox"/> -Make a significant contribution to collection <input checked="" type="checkbox"/> -Final approval of the paper <input checked="" type="checkbox"/> -Corresponding <input checked="" type="checkbox"/> -Play a decisive role in modification <input checked="" type="checkbox"/> -Significant contributions to concepts, designs, practices, analysis and interpretation of data <input checked="" type="checkbox"/> -Participants in Drafting and Revising Papers <input checked="" type="checkbox"/> -Someone who can explain all aspects of the paper <input checked="" type="checkbox"/>

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