

116-0002

ISSN 2423-8775

2-20-7 Arakawa Arakawaku Tokyo Japan

International journal of military affairs

2019 4(2)

<Index>

1. A Study on the Overcoming of the Asymmetry of the Korea-U.S. Alliance: Focusing on the Trump Administration's Security, Economic and MILITARY Alliance Policies.
/ **Choi Won-sang, Moon Hyeon-cheol, Shin Jin**
2. A Study on the Establishment of Drone DEFENSE System against Drone Threats.
/ **Kim Sung-geun, Lee Jong-keon, Moon Sung-chul, Cheung Chong-soo**
3. A Study on the Use of MILLITARY Forces in the NORTH KOREAN Regime.
/ **Park Jong-tak**
4. A Study on the Integrated Protection System against HEMP Threats with THIRA Process.
/ **Kwon Hyuck-shin**

J-INSTITUTE

Publication state: Japan
ISSN: 2423-8775

Publisher: J-INSTITUTE
Website: <http://www.j-institute.jp>

Corresponding author
E-mail: jinshin@cnu.ac.kr

Peer reviewer
E-mail: military@j-institute.jp

<http://dx.doi.org/10.22471/military.2019.4.2.01>

© 2019 J-INSTITUTE

A Study on the Overcoming of the Asymmetry of the Korea-U.S. Alliance: Focusing on the Trump Administration's Security, Economic and MILITARY Alliance Policies

Choi Won-sang¹

Chungnam National University, Daejeon, Republic of Korea

Moon Hyeon-cheol²

Chodang University, Muan, Republic of Korea

Shin Jin^{3*}

Chungnam National University, Daejeon, Republic of Korea

Abstract

The purpose of this study is to find ways to overcome the asymmetry of the Korea-U.S. alliance in order to improve Korea's security autonomy. To this end, the Trump administration's foreign security, economic and military alliance policies were analyzed after considering the security-self-regulation exchange theory in light of the Korea-U.S. alliance. Based on the analysis results, policy suggestions were made to overcome the asymmetry of the Korea-U.S. alliance. This research led to the framework of analysis in Chapter 1 after examining the asymmetric alliance between Korea and the U.S. through the theory of alliance from the perspective of realism and the theory of security-self-regulation exchange. Chapter 2 analyzes the Trump administration's foreign security, economic and military alliance policies and examines what the Trump administration emphasizes and aims at in accordance with the U.S. First America stance. Chapter 3 explored ways to overcome the asymmetry of the Korea-U.S. alliance. Chapter 4 made policy suggestions to overcome the asymmetry of the Korea-U.S. alliance. The study concluded that: First, the U.S.-led Indo-Pacific strategy is strategically engaged in conjunction with South Korea's New South-ern Policy. Second, maintain continued economic cooperation with the U.S. to push for mutually beneficial economic policies for both Seoul and Washington. Third, Korea should improve its U.S.-dependent economic structure.

[Keywords] Korea-U.S. Alliance, Security-Autonomous Exchange Theory, Asymmetric Alliance, Realism, Trump's Administration

1. Introduction and Frame of Analysis

Lee Myung-bak government is a world alliance to contribute to solving problems in agreement with the United States, ours is 'value of alliance', 'comprehensive strategic alliance' a new form of that. Park Geun-hye in May 2013, president and Obama the president of the Korea-U.S. alliance at the summit of climate change, energy security, energy, non-proliferation and global WMD to solve the problem. Led by Korea to work together for the unification of the supported from the international community has identified a 'Global Partnership' to make deployment[1]. Moon Jae-in, the government has Trump for

president and the summit as specified in national security strategy, reciprocal of the Korea-U.S. alliance, pushing for comprehensive development[2]. From an economic point of view, the U.S. is a leading power in the international economy, so there is an asymmetry in the relationship between the two countries as Korea, which depends heavily on foreign countries, cannot overlook its economic benefits, and there is a typical asymmetric alliance because it is an alliance signed as a strong and weak nation. Unlike the Obama administration, the Trump administration's foreign security and economic policies and alliance policies call for greater defense spending to maintain hegemony and stronger new roles for its Asian allies to keep China in check, as it advocates "peace through strength" and

“America First” Therefore, it will be possible to establish the Korea-U.S. alliance in a reciprocal and comprehensive manner while improving the autonomy of national security only when we analyze and respond effectively to the impact of the Trump administration’s alliance policy on the Korea-U.S. alliance.

Therefore, this study derived the framework of analysis after looking at the asymmetric alliance of the Korea-U.S. alliance through the theory of alliance from a realistic perspective and the theory of security-autonomy exchange. In Chapter 2, we analyzed the Trump administration’s foreign security, economic and military alliance policies and looked at what the Trump administration is emphasizing and pursuing. Chapter 3 explored ways to overcome the asymmetry of the Korea-U.S. alliance. In the conclusion of Chapter 4, a policy proposal was made to overcome the asymmetry of the Korea-U.S. alliance.

1.1. Concepts and form factors of asymmetric alliance

Morgenthau, a realist scholar of international political theory, saw the alliance between countries as a vital function for the balance of power in a multinational international system[3]. Snyder also said that the relationship was a joint military action to cope with aggression from countries other than the member states[4]. In his book “The Origin of the Alliance” Walt said it was an agreement between two or more countries for security cooperation, which meant an agreement to prevent armed attacks from virtual enemies or prevent military threats in advance[5]. Morrow divided the country into superpowers, superpowers and weak states according to the size of the national power, focusing on the physical factors of population, territory, resources, military power and economic power, and described the alliances among nations of the same size as symmetrical alliances and between countries of different sizes as asymmetric alliances[6]. When forming an alliance between countries, often by differences in national power, a symmetrical alliance between countries with similar pow-

ers has mutual equal expectations and obligations, while an asymmetrical alliance between powerful and weak countries with many differences in national power has different types of expectations and obligations. In other words, a weak nation, which is allied with a great power, is not guaranteed its own security, but it is limited in autonomy by a powerful nation’s participation in domestic politics.

Realists believe that the international community is anarchy in which no unit exists beyond the state in which it can control its actions, and that each nation has allied itself with other countries to ensure its own security. In particular, a weak nation in the international community chooses an alliance as a strategy supported by a powerful nation to maintain its survival and security. But the alliance between weaker and stronger nations is likely to become asymmetric, as it cannot guarantee its interests at an equal level between each other. In other words, a “alliance dilemma” arises in which small countries yield their own security autonomy in return for receiving the military support of powerful nations for their survival and security. As such, the alliance, which results in a correlation between security and autonomy in the alliance forged by weak and powerful countries, is called a “non-representative alliance”[7]. In these asymmetric alliances, it tends to be a relationship in which small and medium-sized countries are given the means to ensure their security from the superpowers, while unable to make their own policy decisions autonomously. In other words, instead of guaranteeing the security of weak countries, the powerful nation restricts the autonomy of weak countries[8].

1.2. Security-autonomous exchange theory

The security-autonomous exchange model is a similar concept to the theory of the back-to-back relationship, meaning that the weaker depends on the power of the powerful under the asymmetric alliance to obtain the security benefits, the weaker the security autonomy of the weaker countries is under-

mined by the influence of the stronger. Morrow said security and autonomy are inversely related[9]. These claims have shown a valid explanatory power in explaining the relationship between the former weaker and stronger nations. But unlike Morrow's model, as the security environment, the level of threat and the capabilities of the allies change, the weaker countries make efforts to expand autonomy without compromising their own. In other words, a nation whose national power has grown strong enough to improve the expected decline in security level through its own efforts through securing autonomy seeks to increase security and autonomy at the same time in asymmetric. In the asymmetric alliance, the weaker countries want security support from the stronger even if their autonomy is limited, and the stronger countries want to exercise their influence while supporting the weaker ones with security, thereby forming a mutual interest is formed. Thus, a security-autonomous exchange can be seen as a kind of deal that will result in favorable outcomes for both big and small powers. But instead of receiving security support from powerful nations, the weak countries may be limited in their own security autonomy, and the relationship between security and autonomy is established in a semi-proportional relationship, and the weak countries experience conflicts of autonomy[10].

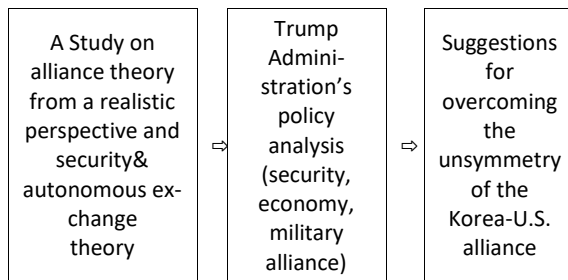
When analyzing the Korea-U.S. alliance as a security-autonomy theory, the reason Korea's security environment has changed differently from the Cold War, but Korea's autonomy has not improved much in the future because its security dependence on the U.S. has not changed much in the course of the Cold War, and the U.S. role in the process of reunification of the Korean Peninsula will be an important factor[11]. Thus, to overcome the security-autonomous exchange dilemma, the weaker countries should make self-rescue efforts to improve their own security capabilities, even if they are supported by a powerful nation. This is because, as many realists claim, the alliance can be dismantled at any time if the interests of the alliance are removed from each other.

1.3. Frame of analysis

The Trump administration is America First, Peace through Strength, The U.S. has a strategy centered on national interests and the importance of alliances as its major policy keynote. For South Korea, the U.S. is trying to eliminate North Korea's nuclear threat in the face of growing political and economic confrontation and competition between the U.S. and China. The two sides should work together to strengthen the South Korea-U.S. alliance and develop relations between Korea and China[12]. The Korea-U.S. alliance has been one-sided by the U.S. since Sept. 11, China's growing influence on the Korean Peninsula, and rising anti-U.S. sentiment in Korea. It is in a difficult situation, including Japan's economic sanctions and conflicts over history issues[13]. To address this situation, the Korea and the U.S. have established policy-significant measures. It has maintained a partnership for mutual national interests. However, recent changes in the security environment at home and abroad and various situations in Korea and the U.S.. It could weaken the maintenance of the Korea-U.S. alliance, and it could weaken North Korea's nuclear threats and trade disputes between South Korea and Japan[14], Demolition of the General Security of Military Information Agreement(GSOMIA)[15] and demand an increase in defense cost sharing under the circumstances[16], the Korea-U.S. alliance may also be called for a change in its relations with regional powers.

After the Cold War, the concept of U.S. security was not only in the traditional security field, but also in the non-military sector. Be included in the scope of the concept as a result, the scope of the alliance is climate, energy, environment, etc. It has been extended to other areas that affect security. In particular, since the inauguration of the Trump administration, the factors behind the alliance's formation have increased in importance to economic interests in previous trust. Given these changes, the framework for the analysis for this study was derived as shown in <Figure 1>.

Figure 1. Framework of analysis.



2. Analyze the Trump Administration's Policies

2.1. Security policy

The main principles applied to the Trump administration's foreign security policies are as follows. First, it is "America First" which measures the cost-effectiveness. Recognize strategic security interests in conjunction with economic interests. In other words, security that does not give tangible benefits is perceived as a subordination to the current profitable economy. What emerges as a result is the strengthening of protectionism. Second, they are "selective intervention" and "enhancing national defense" with "Peace through strength" President Trump emphasizes the management of foreign policy through power at a time when the U.S. is as advantageous as possible on the strong foundation of military and economy. But peace through force does not mean active involvement in international disputes or conflict resolution. Rather, it seeks more cautious intervention than before. In early October 2019, Turkey's betrayal of Kurds, which was a key ally in the fight against Syria's Kurds, was criticized for abandoning the alliance, and was evaluated as a failure of deterrence, a decline in the liberal international system, and a crisis of trust in the alliance system, but this ultimately confirmed the principle that the country's security should be kept on its own[17].

In June 2019, the Pentagon released a report titled "Indo-Pacific Strategy Report: Preparatory, Partnership and Networked Areas" Calling China, Russia, North Korea and transnational issues a threat to the region, the report argues that the most important threat is

China, which is seeking hegemony in the region[18].

The U.S. India-Pacific strategy is expected to evolve into the Obama administration's official regional strategy and the U.S. strategy against Asia. The geographic concept of 'Indo-Pacific' is not 'India annexed to Asia-centric Asia' but 'the geographic concept of placing India on either the core or both axes' while emphasizing the connectivity of the Indian Ocean and the Western Pacific[19]. It is also a U.S. strategy for Asia to check China's rise and a countermeasure to China's "one-to-one strategy". This idea of not losing the initiative in global capitalist growth while besieging China is seen as an active reflection of the U.S. hegemon will[20]. South Korea, which needs to make progressively adjustments to the alliance between the U.S. and South Korea in the process of transferring wartime operational control and a peace regime on the Korean Peninsula. Closely observe the process of shaping the Indo-Pacific strategy, Based on our national interests, we should seek the future direction of the Korea-U.S. alliance.

2.2. Economic policy

In his presidential bid, President Trump pledged to minimize the burden on the U.S. and reduce the trade deficit in order to revive the economy. Since his election, NATO members and allies have called for increased contributions to secure support, while China and many other countries have imposed tariffs, demanding a correction of trade imbalances[21]. President Trump's foreign economic policy is the area where the "America First" stance is most emphasized. The U.S. foreign economic policy stipulates that it seeks to restore U.S. jobs and fair trade supporting industries. To that end, President Trump is emphasizing protectionist foreign economic policies. First, they argue that free trade zones and bilateral free trade agreements are neither fair nor reciprocal. Shortly after his inauguration, he withdrew from the Trans-Pacific Partnership(TPP) and also emphasized the reopening of NAFTA. Since the election, he has insisted on revising or scrapping the Korea-U.S. FTA, pointing out that

trade with South Korea is unfair to the U.S. However, South Korea cannot make a hasty choice because the situation like China's economic sanctions, which have been tainted by the Terminal High Altitude Area Defense (THAAD) system, could recur again[22]. Second, it claims to impose retaliatory tariffs and is advocating protectionism through anti-dumping investigations. In particular, it justified the imposition of punitive tariffs, arguing that "unfair" practices such as exchange rate manipulation in China, Mexico and Japan, and unfair government subsidies, worked against the U.S., resulting in a trade surplus. Third, it insists on introducing a border tax that levies only on imports and does not impose on exports. Rather than importing goods into the U.S. market by levying border taxes on imports, multinational companies from the U.S. and other countries are trying to lure investment and production to the U.S. This is an economic policy that would encourage people to buy U.S. goods by expanding tax revenues and increasing American employment. Fourth, the U.S. trade deficit claims that the other countries are responsible for currency manipulation, which arbitrarily devalues their currency's value. Because China, Taiwan, South Korea, Japan, Germany and Switzerland have something in common to earn a sizable surplus in trade with the U.S., warning of designation as currency manipulators. Fifth, the most important determinant of the Trump administration's external economic policy is its economic growth and job creation. Securing jobs is one of the Trump administration's key economic policies, promising to provide large-scale tax exemptions and remove corporate regulations to U.S. multinational companies that moved overseas, stressing their return to Korea, and pressuring and cashing in on U.S. investment to foreign companies.

President Trump is making it clear in the economic sector that he has no will to maintain and protect the negative free economic order in the United States. Rather, the Trump administration is pushing for a protectionist trade policy that protects the U.S. market and industry, or a free trade order in favor of American goods and services. It could be

done whenever it is deemed necessary for the U.S. national interest, such as adding demands or tariffs on security sharing costs to its allies.

2.3. Military alliance policy

The U.S. and its key allies are recently trying to transform themselves into global partners, expanding their shared strategic interests. Building a global partnership in the U.S. back in 2001. It can be understood in the course of the transition of the defense strategy from a threat-based approach to a capability-based approach, as specified in the Quadrennial Defense Review. During the Cold War, the U.S. clearly supported the security interests the allies would gain by providing deterrence and defense against military threats to their allies, while the U.S. seeks to reorganize its allies on the basis of whether they can share the security interests through preemptive cooperation on a preventive level.

The term "global network" was first used in 2015, indicating that the U.S. "national military strategy" continued to pose a lingering problem with this shift in its military strategy. This comes as the need to strengthen the "network" between the allies, in which the U.S. expects new roles, missions and responsibilities from its allies. As a result, the U.S. expects to select areas of cooperation considering the capabilities of its allies and establish a network of alliance cooperation accordingly. In other words, the U.S. wants to draw on the evolution of selective alliance cooperation in consideration of its allies' capabilities and perceived threat, thereby establishing a support base for maintaining U.S. national interests. White House Report on America's Asia-Pacific Balanced Strategy. Fact Sheet: Advancing Rebalance to Asia and the Pacific(2015). It also shows that the U.S. wants to use its regional partner capabilities to maintain and strengthen its rule-based order and to strengthen cooperative ties to address regional and global-level challenges. The Trump administration is making more concrete in the course of discussions with its Asian and Pacific allies, expecting comprehensive cooperation in various areas such as

missile defense, cybersecurity, maritime security and disaster relief.

In 2015, the U.S. and Japan announced the 'New Defense Cooperation Guidelines', declaring their rise to a global partnership and seeking to evolve from a military alliance to a global alliance that will comprehensively cooperate on various global issues on climate change, poverty eradication and space exploration. Japan has strengthened its alliance with the U.S. since the advent of the Abe administration, and is well illustrated by its desire to improve its security and diplomatic autonomy by expanding the application of its foreign and security policies to other regions. The U.S. and Australia have also sought a transition to a multidisciplinary and comprehensive alliance ranging from development cooperation, peacekeeping operations and cybersecurity since 2011. In order to keep China in check, the U.S. is also promoting cooperation in the security of soda through the linkage of the U.S.-led alliance in Asia and Thailand, and the Australian Institute for Strategic Policy(ASPI) argues in a research report that Australia should shift its defense strategy to counter China's rapid expansion, and that it should form a military alliance with Japan[23]. South Korea Lee Myung-bak government, Park Geun-hye from the current Moon Jae-in, through the government to commonly emphasize a comprehensive alliance with the U.S.. Under the concept of comprehensive security, which broadly applies not only traditional security confined to military areas but also non-military ones, the process of building alliances between the United States, Japan and Australia under the Indo-Pacific strategy gives much meaning to the future development of the South Korea-U.S. alliance.

3. A Study on Overcoming the Asymmetry of the Korea-U.S. Alliance

Korea and the U.S. are working together in the Asia-Pacific region on various security issues. For the reciprocal and comprehensive establishment of the Korea-U.S. alliance and future development, the geopolitical position

facing Korea, the aspects of security threats and the aspects of national security interests will make important decisions in the reciprocal and comprehensive alliance.

At the time of the Korea-U.S. alliance, the asymmetrical alliance has been maintained in the context of security and economy, which Seoul is forced to follow unilateral choices and decisions by Washington rather than selective demands on Washington. But such asymmetrical alliances are also slowly changing after the Cold War, with changes in the international situation, the security environment on the Korean Peninsula and, above all, various self-rescue efforts to strengthen the nation's national power. The changes will have a more synergistic effect only if they are carried out in accordance with U.S. foreign policy. In this context, it is necessary to strategically implement the Indo-Pacific strategy, which the Trump administration is actively pursuing in response to China's one-to-one initiative, in conjunction with the current administration's New Southern Policy. This is important for expanding diplomatic space through diplomatic diversification by deepening cooperative ties with various countries to expand their international roles as a middle power amid geopolitical tension and rivalry in Northeast Asia. This will allow the U.S. to gain an upper hand and participate in the Indo-Pacific strategy. A special Korea-ASEAN summit held in Busan in November, after meeting in the Moon Jae-in, the president of the ASEAN countries with the leaders of the joint vision statement[24].

The plan calls for sharing the values of prosperity and peace in various fields, including economy, society and culture, while opposing protectionism and promoting peace on the Korean Peninsula. After the meeting, the government will establish the New Southern Policy 2.0 and implement it in earnest from 2021[25].

Therefore, if pushed in conjunction with the U.S. Indo-Pacific strategy, it will be able to push ahead without any impact despite the restoration of trust for internalizing cooperative partnership with China and the strengthening of close communication channels. Korea-China relations should also be dealt with

carefully, as the deployment of the Terminal High Altitude Area Defense (THAAD) has already caused diplomatic and economic difficulties with China.

The Trump administration values economic and national interests, as shown by the U.S. priority and protectionist trade policy stances. Therefore, the demand for an increase in the Korea-U.S. defense budget should be set so that the security posture will not be compromised, considering the internal political opinions and economic conditions of the two countries in consideration of the Korea-U.S. FTA, which was renegotiated in 2018. If a review is made on various options, including command and transfer of wartime operational control of U.S. troops in Korea, it will not only bring economic interests but also a new type of Korea-U.S. alliance and security environment to both countries.

It should maintain its alliance with the Trump administration, which prioritizes economic benefits, while improving Korea's economic structure dependent on the U.S. to overcome and improve the asymmetry in security-self-reliance relations. To do so, the two countries should diversify their trading partners according to the New Southern Policy discussed earlier. There should be improvements in strategic and policy support and systems at the national level to improve the quality and design of products based on technology development. There is also a need for consultations on mutual tariffs.

If the Trump administration implements an alliance policy that puts U.S. economic interests first, and South Korea pushes for economic policy in a way that increases its policy autonomy to demand corresponding benefits, the two allies will be built in a mutually economically beneficial manner. If Korea strategically approaches the future design of the Korea-U.S. alliance so that it can enhance Korea's image and status as a middle power in the international community from a long-term perspective and develop it from an asymmetric alliance to a more autonomous one, both security and autonomy will be enhanced, thus establishing a reciprocal and comprehensive alliance between Korea and U.S..

4. Conclusion and Suggestion

The following are policy suggestions for building the Korea-U.S. alliance in a reciprocal and comprehensive manner. First, participate in the U.S.-led Indo-Pacific strategy strategically linking the New Southern Policy actively pursued by the incumbent administration. The U.S. also wants South Korea to actively participate in its Indo-Pacific strategy. If South Korea participates, it would be an opportunity to boost Seoul's international standing by pushing the alliance into a future-oriented relationship and strengthening cooperation with a number of ASEAN countries along with Japan, Australia, New Zealand and India, which are already participating. Therefore, also suffers similar battle for supremacy between the United States and South Korea and Southeast Asian countries, and Moon Jae-in, because they are looking to diversify its foreign New Southern Policy of the president. Based on trade as well as to increase security cooperation with Southeast Asian countries are also needed. Second, it should continue economic cooperation with the U.S. to pursue mutually beneficial economic policies for both Korea and U.S.. It will not be easy to resolve the North Korean nuclear issue, so South Korea should come up with a solution with the U.S. The Trump administration is pushing North Korea with both strong pressure and dialogue, but its North Korea policy stance may change if a new administration takes office after 2020. Therefore, it is also necessary to check the candidates' foreign security, economy and alliance commitments and take preemptive action. The U.S. should take a policy response depending on the internal political situation, but respond flexibly while considering the possibility of change. Third, the U.S.-dependent economic structure should be improved. Strategically pushing for diversification of trading partners, technological and design development of export items, and mutual tariff consultation will reduce economic dependence on the U.S. so that agreements such as FTAs can be carried out in Korea's favor and the autonomy of security from the economy.

5. References

5.1. Journal articles

- [1] Choi BW & Im YS. Influential Factors of the Korea-U.S. Alliance and Development Direction. *New Asia*, 25(1), 1-9 (2018).
- [4] Snyder GH. Alliance Theory: A Neorealist First Cut. *Journal of International Affairs*, 44, 104-104 (1990).
- [6] Morrow JD. Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliance. *American Journal of Political Science*, 35(4), 906-907 (1991).
- [7] Lee WT. The Asymmetry of the ROK-U.S. Alliance and the Direction of the Alliance's Development. *The Journal of Political Science and Communication*, 19(1), 52-53 (2016).
- [9] Morrow JD. Alliances and Asymmetry: An Alternative to the Capability Aggregation Model of Alliance. *American Journal of Political Science*, 35(4), 914-914 (1991).
- [11] Jang NS. Exchangeability of Exchange Alliance Models: Asymmetric Korea-U.S. Security Alliance. *The Korean Journal of International Studies*, 36(1), 79-104 (1996).
- [13] Kim SH. The U.S. Trump Administration's Sinauguration and the Direction of the Korea-U.S. Relationship. *New Asia*, 24(1), 12-12 (2017).
- [20] Park IH. A Parallel Development of the Korean Peninsula Issue and the Korea-U.S. Alliance and South Korea-China Relations. *Journal of the Korean Association for the Joint Regional Unification*, 2(1), 6-7 (2018).
- [21] An MS. Moon Jae-in and Alliance between Seoul and Washington - A Study on the Sustainability of the Alliance. *Journal of North-East Asian Studies*, 23(4), 76-76 (2018).
- [22] Shin J. The Predictive Analysis of the Korean Government's Diplomacy with China. *The Journal of the Korean Political Science Society*, 26(2), 149-149 (2018).

5.2. Books

- [2] The National Security. National Security Strategy in Moon Jae-in Government. The National Security, 83 (2018).
- [3] Morgenthau HJ. Politics among Nations: The Struggle for Power and Peace. Alfred A. Knoff, 246 (1973).

- [5] Walt SM. The Origins of Alliances. Cornell University, 12 (1987).
- [8] Han YS. Independent National Defense in the Alliance: The Theory and the Practical Dwarf. Independence or Alliance: The Way of the 21st Century Korea's Security Diplomacy. Oruem, 29 (2004).
- [10] David Vital. The Survival of Small States: Studies in Small Power-great Power Conflict, 183-185 (1971).

5.3. Additional references

- [12] Lee MC. Defense Issues, 1689, 2 (2017).
- [14] Kim BK. Yonhapnews, August, 28 (2019).
- [15] Moon BK. The Donga Ilbo, August, 23 (2019).
- [16] Choi JS. The Donga Ilbo, December, 4 (2019).
- [17] Lee SJ. The Defense Daily, October, 29 (2019).
- [18] Lee JH. The Defense Daily, June, 20 (2019).
- [19] Seol IH. Defense Issues, 1740, 2 (2019).
- [23] Chung DC. Yonhapnews, June, 12 (2019).
- [24] Hong HI. Yonhapnews, November, 26 (2019).
- [25] Lee DY. MBC News, November, 27 (2019).

Lead Author

Choi Won-sang / Chungnam National University Researcher

B.A. Chungnam National University

M.A. Hansung University

Ph.D. Chungnam National University

Research field

- A Study on the Protection and Utilization of Personal Information for the Operation of Artificial Intelligence and Big Data in the Fourth Industrial Revolution, Convergence Security Journal, 19(5) (2019).
- A Study on the Paradigm Shift of Government Emergency Preparedness in the fourth Industrial Revolution, Crisisonomy, 15(7) (2019).

Major career

- 1994~2016. Department of Defense, Officer
- 2016~present. Ministry of the Interior and Safety, Emergency Planning Professional Officer

Co-Author

Moon Hyeon-cheol / Chodang University Professor

B.A. Chosun University

M.A. Chosun University

Ph.D. Chosun University

Research field

- A Study on the Improvement of Resource Management for the Establishment of a Smart Operation System for the Future War, International Journal of Military Affairs, 4(1) (2019).

Major career

- 2007~present. NSC, MND, JCS Policy Advisory Committee, Member
- 2019~present. National Crisis Management Association, Director

Corresponding Author

Shin Jin / Chungnam National University Professor

B.A. Sungkyunkwan University

M.A. Seoul National University

Ph.D. Seoul National University

Research field

- A Predictive Analysis of the Korean Government's Diplomacy with China, The Korean Journal of Political Science, 26(2) (2018).
- North Korea's Cyber Specialist's Talent Education and Its Achievement, The Korean Journal of Political Science, 27(4) (2019).

Major career

- 2011~present. Chungnam National University, Director of National Institute of Strategic Studies
- 2011~present. The Institute for Peace Affairs, President

Publication state: Japan
ISSN: 2423-8775

Publisher: J-INSTITUTE
Website: <http://www.j-institute.jp>

Corresponding author
E-mail: jkeonlee@cau.ac.kr

Peer reviewer
E-mail: military@j-institute.jp

<http://dx.doi.org/10.22471/military.2019.4.2.10>

© 2019 J-INSTITUTE

A Study on the Establishment of Drone DEFENSE System against Drone Threats

Kim Sung-geun¹

Soongsil University, Seoul, Republic of Korea

Lee Jong-keon^{2*}

Chungang University, Seoul, Republic of Korea

Moon Sung-chul³

Desaster Safety Drone Institute, Anyong, Republic of Korea

Cheung Chong-soo⁴

Soongsil University, Seoul, Republic of Korea

Abstract

The purpose of this study is to look at the threat of drones that are becoming a reality in the world, and to suggest ways to establish the Drone Defense System(DDS) for nation's critical facilities. If the 9/11 terrorist attacks were carried out by a civilian aircraft to change the paradigm of terror attacks, the threat is great because now the drone-based terrorist attempts have a way to secretly use drones while the safety of the terrorists has been guaranteed. The recent drone terrorism was enough to show the threat to everyone in the world. In addition, the movement of wind lanterns in the air caused a fire in an oil storage facility, causing great damage, showing how lethargic the defense system of the two-dimensional, nation's critical facilities on the ground is. To raise the need for preparedness against drone terrorist threats, the study analyzed cases of overseas drone terrorism and the threat of drones themselves, and studied DDS building and legal issues to prepare them. The basic concept of establishing the DDS is to establish the system in accordance with a step-by-step process called drone detection, identification and neutralization. The DDS should basically be prepared with a one-minute operational concept. This is because the time allowed to respond to drones that are trying to launch terrorist attacks is about one minute. No matter how good DDS equipment is built and operated, it will inevitably fail to defend itself if it misses operational response time. Therefore, DDS need to be equipped with surveillance and strike capabilities that automatically link detection, identification, and neutralization, and the establishment of high-level DDS in peacetime so that they can be prepared with one minute's operation until detection, identification, and neutralization.

[Keywords] Drone Threats, Drone Terrorism, Nation's Critical Facilities, Drone Defense System(DDS), Drone-Related Laws

1. Introduction

This study is aimed at establishing the Drone Defense System(DDS) at nation's critical facilities to prepare for the threat of drones emerging as new threats. If the 9/11 terrorist attacks were carried out by a civilian aircraft to change the paradigm of terror attacks, the threat is great because now the drone-based terrorist attempts have a way to secretly use drones while the safety of the terrorists has been guaranteed.

The recent drone attacks and airborne threats were enough to show the threat to everyone in the world. Just on Sept. 14, 2019, a drone attack on Saudi Arabia's state-run oil company by suspected Yemeni rebels in two areas reduced daily crude production by 50 percent, or 5.7 million barrels[1], and property damage about four million dollars caused by a fire in a low-oil tank in Goyang on a windfall on Oct. 15, 2018[2].

The reality is that the nation's critical facilities maintain a two-dimensional and flat defense system under the concept of defense

in the three zones based on the Integrated Defense Act and the Presidential Decree No. 28, so there is a lack of preparedness for the threat of three-dimensional drone terrorism through drones. Considering these factors, legal solution and deployment of DDS were studied to effectively prepare for the threat of drone attacks to nation's critical facilities.

2. Realizing Drone Threats

Now drones are coming to us as a threat, despite all the positive uses. We will discuss how the drone threat has come, what it is, and how it's becoming a reality.

2.1. Has the drone threat arrived?

When we ask people around you if a drone threat has arrived, everyone says it poses a threat. The reason why this question is so easy to say may be because we have often been exposed to situations caused by drones on TV or the Internet through domestic and international media. In this study, we conclude that drone threat has arrived even if we do not conduct survey unnecessarily. Answers to the arrival of drone threats can be expressed in just one word for "Yes." This hasty conclusion is due to the fact that drones are posing a threat to the nation's critical facilities and others that we should protect even faster than we realize.

2.2. What is the drone threat?

In order to find out what the drone threat is, we need to reach its essence. As we approach the essence of a drone, we can identify the four fundamental threats it poses, as in <Figure 1>.

Figure 1. The threat of drones.

1 Small: Existing radar can't identify. Development and maintenance of detection and identification equipment is required.	 Kalashnikov (1.2 m wide)
2 Explosive: Fatal damage Requires incapacitation (physical, electronic, etc.)	6 lbs/2.7 kg
3 Reactivity: Less time to respond to threats Skilled response system operation required	129 km/h, 30 minutes, within a radius of 60 km
4 Budget: It takes a lot of budget to maintain and maintenance Requires political leadership, social consensus and public support	Drone is cheap. 22.8 billion won

First of all, drones are small things. The existing radar cannot identify them because they are too small. Therefore, equipment for special detection and identification should be developed and equipped to detect and identify drones that pose threats.

Second, the drone's bombing has caused fatal damage. Previously, explosives that can be loaded into drones were not considered a threat due to the low weight of explosives, but now the explosive is big enough to deal a serious blow to nation's critical facilities.

Third, the speed of the drone. The drones can travel an average of 72km/h, and can make a dash faster in the event of a final attack. Because it is difficult to have a system that can respond to such rapid drone threats, the threat is even greater." Therefore, it needs to have a skilled response system to respond to drone threats.

Finally, it takes a lot of budget to prepare for drone threats. The large budget itself poses a threat. Therefore, a strong will to prepare for drone threats from political leadership, social consensus and public support are required.

Kalishnikov, the maker of the AK-47 rifle, presented the KUB-UAV suicide bomber at the defense exhibition "IDEX 2019" in Abu Dhabi, the United Arab Emirates. The KUB is a 1.2 m-wide, 6-lb(2.7kg) explosive, flying for 30 minutes at 129km/h(2,150m/minute) and capable of striking targets within a radius of 60km[3].

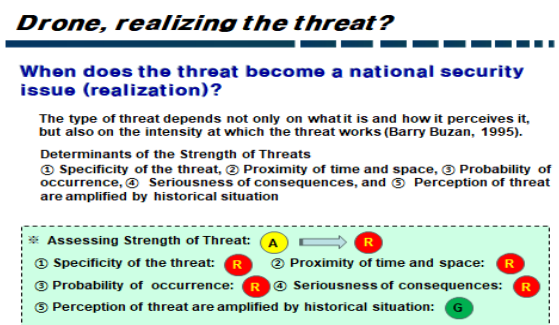
2.3. Will the drone threat become a reality?

As an approach that could make drone threats a reality, in 1995, Barrie Boozhan answered, "When will the threat become a national security issue. This question can also be applied to when drone threats will become a reality.

As for when the threat becomes a national security issue, Barry Buzan said, "It depends not only on what kind of threat is and how the threat is perceived, but also on the intensity that the threat works[4]." The determinants of the strength of the threat were viewed as

specificity of the threat, spatial proximity, probability of occurrence, seriousness of its consequence, and recognition of the threat as amplified by historical circumstances. If you apply the strength determinant of this threat to Korea against the drone threat, the intensity of the threat is a red light, as shown in <Figure 2>.

Figure 2. Realization of the drone threats.



The specifics of the threat, the proximity of time and space, the probability of occurrence, the seriousness of its consequence, and the perception of the threat are amplified by the historical situation.

In terms of the specific nature of the threat, the strength of the drone threat has been identified, and in time and space, drones are close to the nation's critical facilities that we must protect, and the consequence can be expected as well as the probability of occurrence. Considering the past experience of North Korea's bombing of a KAL plane and the sinking of a South Korean warship by surprise attacks on the Cheonan, it is believed that terrorist attacks by drones could occur as many times as possible depending on the political situation.

3. What are the Domestic and International Drone Attacks Cases and Their Goals?

The domestic and foreign drone attacks show where their future direction will be.

3.1. What is the goal of overseas drone terrorism?

If the 9/11 terrorist attacks were carried out on civilian aircraft to change the paradigm of terror attacks[5], Now the attempt to use drones has become a guarantee for the safety of the terrorist, then the threat is even greater in that there is a covert way to use drones to carry out terrorism.

Figure 3. Overseas drone terrorism objectives.

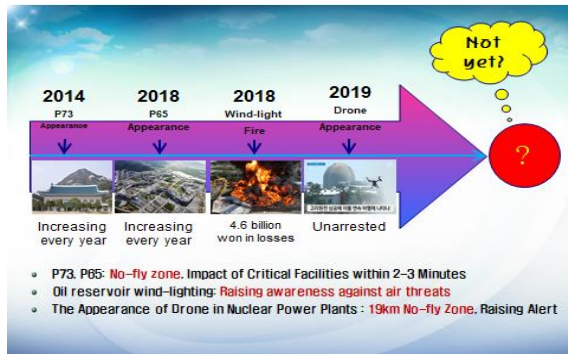


As shown in <Figure 3>, a drone bomb supposedly floated by ISIS on Oct. 11, 2016, killed two people and wounded two others in Iraq, showing the drone became a striker[6]. On Aug. 5, 2018, seven soldiers were injured in a drone bomb attack while Venezuelan President Maduro was speaking at an event marking the 81st anniversary of the founding of the National Defense Forces in the capital city of Caracas[7]. And on September 14, 2019, oil production in Korea was 50 percent (5.7 million barrels) due to 10 drone attacks by Yemeni rebels, which are believed to be behind Iran in two Saudi Arabian oil refineries. Decreased terror attacks have raised global awareness of drone terrorism[1].

3.2. What is the goal of drone terrorism in Korea?

The case of terrorist attacks by drones here has not been confirmed, but the danger is already close to us. In particular, as the fourth industrial revolution and the use of high-speed Internet have become the world's most hyper-connected society, drone terror preparation is becoming an important task as damage to nation's critical facilities can be linked.

Figure 4. Goal of drone terrorism in Korea.



As shown in <Figure 4>, the number of drone launches has been increasing every year since 2014 in area P73 in Seoul, the capital city, and P65 area in Daejeon, which has been off-limits, and the low-altitude fire accident in Goyang caused by the sky lantern on October 7, 2018 has shown how vulnerable it is to the public threat to the nation's critical facilities, and the public opinion has been that it should be given to Sri Lankan. In September 2019, drones appeared in no-fly zones in the Gori and Hanvit nuclear power stations, raising awareness of drone terrorism.

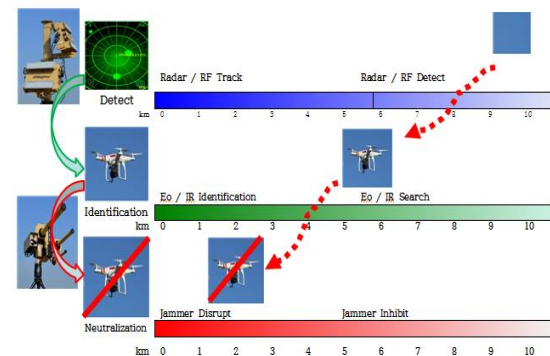
4. Establishment of the DDS

As the threat of drone terrorism increases, the establishment of a DDS is becoming a public debate. Some key facilities are already in operation with DDS, some facilities such as Incheon International Airport are under construction, and the deployment of DDS, including state-run infrastructure, has become a pressing issue that can no longer be delayed. Under these circumstances, we will study the concept of establishing a DDS and how to deploy it.

4.1. Basic concepts for deploying DDS

The basic concept of building DDS is to establish DDS according to the step-by-step process of detecting, identifying and neutralizing drones[7], as shown in <Figure 5>. Drone detection is detected by radar and RF scanners, and drone identification takes place through EO/IR, and drone jammers are used to neutralize hostile drones.

Figure 5. A basic concept for the establishment of the DDS.



4.2. Methods for building the DDS

Methods for establishing DDS can be established in variety depending on equipment construction cost and equipment performance. If equipment construction costs are high, equipment that has good performance can be equipped with them, and if equipment construction costs are low, equipment that has relatively poor performance will have to be built. As you can see in <Figure 6>, there is a way to build a DDS based on how to detect and identify hostile drones that are attempting major attacks, and how to disable them[6].

Figure 6. Methods for building the DDS.

Sortation	Equipment	Using purpose
Detection / identification	detection radar	Drone Detection Dedicated Radar(maximum detection range: 10km(±), RCS 0.01 m² Criteria)
	RF Scanner	Directional Detection with Drone Communication Protocol (Detects instrument radius of 6 km (±))
	Video surveillance	EO/IR etc., maximum detection distance of 8 km (±)
	UTM	2021 scheduled to be introduced, equipped with a drone identification card
neutralization	Hard kill	birds of prey, nets, guns, lasers, etc ☒ Operation of key defense facilities
	Softkill	Geofencing, Jamming, Spoofing, etc ☒ Disabling drones by radio disturbance

☒ Construction method varies according to cost and equipment performance

DDS systems can be established in a variety of ways depending on construction costs and equipment performance. <Figure 7> compares the performance of each type of drone detection sensor in the deployment of a DDS, divided by the type of drone detection sensor: acoustic, RF scanner, radar, EO/IR, detection range, accuracy, tracking capability, identification capability, hover-ring target identification, and long-range flight target

identification[8]. Generally, composite sensors are recommended. When equipment equipped with composite sensors is built, drones can be detected in a variety of situations such as fog, clouds, and downtown areas.

Figure 7. Performance comparison of different types of drone detection sensors.

Sortation	Acoustic	RF Scanner	Radar	EO/IR	composite sensor
detection range	×	△	○	△	○
detection capacity	○	△	○	△	○
Accuracy	×	△	○	△	○
Tracking status	×	○	○	○	○
identification ability	×	△	△	○	○
hovering target	○	○	×	○	○
Automatic Flight Target	○	×	○	○	○

☞ Generally, complex sensors are recommended, and the radar detection distance depends greatly on the target size

There are many thorny issues that need to be solved in order to establish and operate a DDS on nation's critical facilities. First, there is a lack of empirical data on the capabilities of relevant equipment in relation to the deployment of the DDS, and there is also difficulty in securing budget to purchase proper equipment. It also needs to be discussed whether detection-identification-force equipment should be secured individually or built into an integrated defense system with composite sensors. And most of all, acting as a constraint is a legal matter. Under the current radio wave law, the use of jammers causing radio disturbance is prohibited. <Figure 8> outlines legal restrictions on the deployment of a DDS.

Figure 8. Legal restrictions on the establishment of the DDS.

Sortation	legal availability			remark
	yes	Limit	No	
drone patrol	○			Possible after flight approval
aerial photography	○			Available after Air Shot Authorization
drone detection	○			
drone strike			○	Radio wave law (using jammer), aviation safety law, airport facilities law, and anti-terrorism law need to be revised.
Inspecting facilities	○			
pesticide spraying	○			Possible after flight approval

☞ In common, the "Location Information Act" needs to be revised.

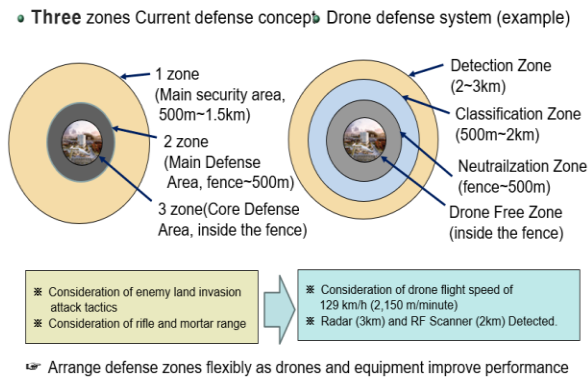
What is possible through current legal approval are drone patrols, aerial photography, drone detection, drone utilization facilities check, drone control, and so on, and what is not possible is for drone attacks[9]. In order to strike a terrorist-driven drone, the radio wave law must be revised to allow the use of jammers. In addition, the Aviation Safety Act, the Airport Facilities Act and the Terrorism Prevention Act should be amended in conjunction with each other. In addition, the Location Information Act should be amended in common, and it is currently not possible to identify an individual's location information under the Location Information Act.

4.3. Demand for change of the concept of protection in the three zones of nation's critical facilities

Nation's crucial facilities are designed to be prepared for threats in accordance with the concept of protection in the three zones. This is a ground-oriented concept that does not take into account the threat of drones. The first zone is that the area is 500m to 1.5km from the fence, which is organized in consideration of the mortar range. The second zone(main defense zone) is located up to 500m from the fence and takes into account the effective range of the rifle[3]. The third zone(core defense zone) is an area with nation's critical facilities inside the fence[10].

On the other hand, the formation of the drone defense zone considered the drone's flight speed of 129km/h per minute (2,150m/minute), and the radar(3km) and RF scanner(2km) detection range, as seen in <Figure 9>. Areas of interest(detection) will be divided into areas ranging from 2km to 3km, areas(border area, identification) from 500m to 2km, areas(main defenses zone, incapacitation) from fence to 500 meters, and areas from fences to core facilities within. In contrast to this drone, the formation of the three-point protection zone will require flexible arrangement of the three zones depending on the performance development and improvement of drones and equipment.

Figure 9. Demand for change of the concept of protection in three zones of nation's critical facilities.

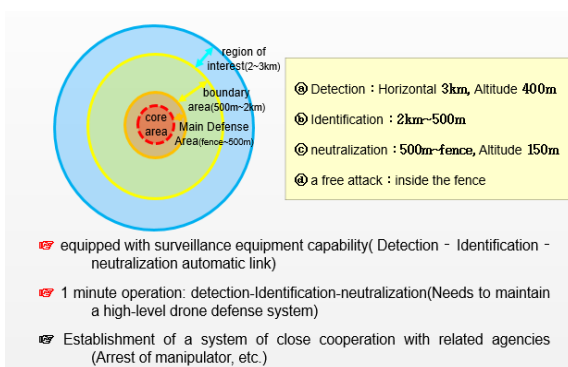


4.4. Establishing a one-minute drone defense system

The DDS should basically be prepared with a one-minute operational concept. This is because when a drone that tries to attempt a terrorist attack at 2,150m per minute, the time allowed to respond is about one minute.

No matter how good DDS equipment it makes and operates, it will inevitably fail to defend itself if it misses operational response time. Therefore, the DDS should be equipped with surveillance and strike capabilities that automatically link detection-identification and force, as shown in <Figure 10>, and maintain the high-level DDS in a normal manner to prepare for detection-identification-neutralization with one minute's operation. In addition, if drone terrorism attacks are carried out near facilities, it is necessary to establish a close cooperation system with related agencies to arrest pilots and to conduct regular training during normal times.

Figure 10. Building a one-minute drone defense system.



5. Conclusions

In the above we learned about the threat of drones and their defense system. The threat of drone terrorism is increasingly dangerous, as seen in drone terrorism cases at home and abroad.

It is important to operate a system that can prepare for drone defense with a one-minute operational concept by equipping automated systems that are fully connected to detection, identification, and disable way.

The implications of establishing a DDS against drone threats through the above research are as follows:

First, the number of terrorist attacks using drones is on the rise. The drone attacks are becoming more likely to be carried out because they are equipped with guns, explosives, etc., and remote control allows terrorists to attack targets in a safe environment at low cost[7].

Second, the government needs to prepare for drone terrorism on the nation's. As the possibility of using drones to achieve its political goals grows, nation's critical facilities may be subject to drone terrorism, so the DDS will have to be built before the threat becomes a reality.

Third, it is necessary to establish a dedicated organization and expand the number of professionals in preparation for drone terrorism [7]. Since drone terrorism is a technical threat that the existing defense system cannot respond to the threat in time and physically, it will have to operate the actual DDS by effectively operating the deployed equipment, rather than simply deploying the equipment.

Finally, in order to properly establish a DDS, current legal restrictions must be addressed. Although the principle of using radio wave environment should not hinder or block the use of other people's radio wave, the DDS, such as the use of jammers, should be able to operate within a limited scope to protect the people and prevent terrorism for public safety.

The research focused on the need to establish a DDS and the concept of deployment. Further in-depth research is required on specific performance of detection, identification, and deactivation equipment related to deployment equipment.

6. References

6.1. Journal articles

- [4] Buzan B. New Patterns of Global Security in the Twenty-first Century. *International Affairs*, 67(3), 431-451 (1991).
- [7] Hong TH & Lee SH. A Study on Counter-measures Against Drone-terror Threat of National Important Facilities. *Journal of Korean National Security and Public Safety Association*, 7, 90-115 (2018).
- [9] Park JH. Study on the Legal Issues on the Unmanned Aircraft System. *Hongik Law Review*, 16(2), 79-104 (2015).

6.2. Conference proceedings

- [5] Oh HJ. Countermeasure of Drone Attack for Public Safety in the Public Place. The 2018 Annual Conference of Korea Society of Disaster Information, 97-98 (2018).
- [6] Oh SJ & Jung JM & Lee JM. A Study on the Anti-drone Market and Related Technology. The 2017 Annual Conference of Korea Society of Disaster Information, 99-100 (2017).

6.3. Additional references

- [1] <https://www.seoul.co.kr/> (2019).
- [2] <https://news.chosun.com/> (2019).
- [3] <https://blog.naver.com/> (2019).
- [8] <https://www.dronesdirectory.com/> (2019).
- [10] <https://desert.tistory.com/> (2019).

Lead Author**Kim Sung-geun** / Soongsil University Researcher

B.A. Korea Military Academy

M.A. Korea National Defence University

Ph.D. Dongguk University

Research field

- A Study on the Effective Command Disaster Site: Lessons Learned from Sinking of the Sewol Ferry, The Society of Digital Policy & Management, 12(11) (2014).
- A Study on the Elements(MORT-TAC) of Situation Assessment at Disaster Sites, The Society of Digital Policy & Management, 15(1) (2017).

Major career

- 1988~2017. Ministry of National Defence, Officer
- 2019~present. Soongsil University, Researcher

Co-Author**Cheung Chong-soo** / Soongsil University Professor

B.A. Chosun University

M.A. Chosun University

Ph.D. Chosun University

Research field

- Development of an Application for Life Safety Continuity Method based on National Point Numbers and NFC, Journal of the Society of Disaster Information, 15(2) (2019).
- The Study on the Utilization of eSOP System for Disaster Response & Situation Management Based on the Planning, Journal of Korean Society of Hazard Mitigation, 17(6) (2017).

Major career

- 2015~present. Soongsil University, Professor

Corresponding Author**Lee Jong-keon** / Chungang University Professor

B.A. Korea Military Academy

M.A. Yonsei University

Ph.D. Yonsei University

Research field

- The Effects of Slack Resources on Firm Performance and Innovation in the Korean Pharmaceutical Industry, Asian Journal of Technology Innovation, 25(3) (2017).
- Role Clarity and Organizational Commitment in Food Manufacturing and Distribution Firms: The Mediating Role of Creativity, Journal of Distribution Science, 15(1) (2017).

Major career

- 2005~present. Chungang University, Professor
- 2017~present. Korean Employment & Career Association, Director

Co-Author**Moon Sung-chul** / Executives Disaster Safety Drone Institute Researcher

B.A. Korea Military Academy

M.A. Korea University

Ph.D. Yeongnam University

Research field

- A Study on the Establishment of Drone Defense System against Drone Threats, International Journal of Military Affairs, 4(2) (2019).

Major career

- 1986~2019. Ministry of National Defence, Officer
- 2019~present. Disaster Safety Drone Institute, Executives

Publication state: Japan
ISSN: 2423-8775

Publisher: J-INSTITUTE
Website: <http://www.j-institute.jp>

Corresponding author
E-mail: kadiaz@naver.com

Peer reviewer
E-mail: military@j-institute.jp

<http://dx.doi.org/10.22471/military.2019.4.2.18>

© 2019 J-INSTITUTE

A Study on the Use of MILLITARY Forces in the NORTH KOREAN Regime

Park Jong-tak

Chosun University, Gwangju, Republic of Korea

Abstract

The purpose of this study is to analyze the role of the North Korean People's Army from early establishment of the regime to present in North Korea and to identify whether Kim Jungeun is reducing the military force on contrary to the former reign for reorganizing into a normal socialist state.

North Korea focuses all national capacities on the North Korean People's Army and the North Korean People's Army is serving as an exclusive tool of the leader since the establishment of North Korean regime. During the Kim Il-sung period, he organized the North Korean People's Army, ousted the political opponent, and used the North Korean People's Army as the tool for completing Juche Ideology. During the Kim Jungil period, he used North Korean People's Army to stabilize the regime and solve severe financial difficulties caused by the collapse of socialistic planned economy system and fall of socialist states in Eastern regions. He also overcame crisis by using North Korean People's Army in overall national industries.

It was the Kim Jungeun period that controlled and reduced North Korean People's Army. Kim is showing the wills toward denuclearization by claiming for relieving sanctions against North Korea and guaranteeing the current system. In North Korean regime, however, 'Nuclear Weapon' grants self-confidence to North Korean People's Army and residents, stabilizes the system, and serves as a tool for advantageous negotiation result by threatening and pressuring South Korea and the United States. Kim will never give up nuclear weapon. Also, North Korean military system will stay firm and reveal its side as military state.

[Keywords] Military First, North Korea, Nuclear, Kim Jung Un, A Military State

1. Introduction

North Korea is a closed and abnormal military-centered socialist state. In a normal socialist system, the party makes the decision on military issues and holds the authority. The basic models for socialist state are the Soviet Union and China. In regard to basic structure, the North Korean People's Army is thoroughly in charge of enforcement under the Communist Party. In contrary, North Korea has been maintaining its regime based on violence, force, and fears essential for dictatorial powers since the early establishment of regime.

In the early stage of North Korean regime, Kim Il-sung seized the power and established

dictatorship by using the armed anti-Japanese forces[1]. As the power was handed down to Kim Jungil, the role of North Korean People's Army went beyond regime stabilization and social control and it was expanded to all industries and ideology. In Kim Jungeun regime, the powers were handed down for 3 generations unprecedentedly in the modern and contemporary history. Kim Jungeun regime showed an aspect of normal socialist state where all the powers of North Korean People's Army are transferred to the party. Also, control and reduction on the North Korean People's Army enlarged by the Military First Policy during Kim Jungil regime and oust and demotion of military personnel led to

weakening of *North Korean People's Army*. Considering the phenomenal aspects, it seems that Kim Jungeun is reorganizing North Korea into a normal socialist state.

The purpose of this study is to analyze the role of the *North Korean People's Army* from early establishment of the regime to present in North Korea and to identify whether Kim Jungeun is reducing the power of *North Korean People's Army* on contrary to the former reign for reorganizing into a normal socialist state.

2. The Role of North Korean People's Army in Kim Ilsung Regime

2.1. The background of establishment of the North Korean regime

Right after independence, Kim Ilsung could not exercise much influence in North Korea. Although he led armed anti-Japanese force and participated in anti-Japanese movement, he was pushed out by other socialist politicians in terms of political position. In response, Kim Ilsung focused on dominating all armed forces armed anti-Japanese forces. Based on such dominance over the forces, the Soviet Union supported Kim Ilsung. He soon seized the Workers' Party of Korea and secured political position.

Kim Ilsung could get supports from the Soviet Union, oust the political opponent after the Korean War, and establish his own regime because he had dominance and control over the *North Korean People's Army* based on the armed anti-Japanese force. Politicization of military often happens in socialist states. In North Korea, however, the *North Korean People's Army* went beyond politicization and showed its side as a military state after the establishment of the regime. The party dominated by the Kim Ilsung's *North Korean People's Army* became the base for completing the dictatorship. Furthermore, the *North Korean People's Army* played a crucial role in succeeding the power to Kim Jungil[2].

2.2. Kim Ilsung's establishment 'Juche' ideology

One of the distinguished characteristics of

North Korean People's Army is that the tendency of 'Politicization' of military is stronger than other socialist states. *North Korean People's Army* has been developing in close relation to maintaining the North Korean system and regime[3].

Kim Ilsung's establishment of the Juche ideology was the time when 'Politicization' of military had the most influence. Juche Ideology is defined as the combination of national independence and Korean nationalism. It starts from a simple proposition of excluding foreign power's intervention and making a country where the residents are the owner. However, Juche Ideology emerged in 1950s when Kim Ilsung started to eliminate potential competitors and expand political position by mobilizing the *North Korean People's Army*. Kim Ilsung used Juche Ideology to oust his political opponents, factions in the Soviet Union and China[4].

Considering that establishment of North Korean regime was possible through the support from Soviet Union and role and sacrifice of China during the Korean War, Juche Ideology is a theory that starts from the contradiction. However, Kim Ilsung ideologically developed Juche Ideology and used as a mean to control North Korean residents and to deify himself. In ideological development of Juche Ideology, *North Korean People's Army* served as the driving force. Kim Ilsung used the power of *North Korean People's Army* and he strengthened his power to make excuse and eliminate the powers strengthening and opposing his authority. In the early stage of North Korean regime, Kim Ilsung used the *North Korean People's Army* under control to eliminate each communist faction such as Soviet Union Fraction, Gapsan Fraction, and Yeonan Fraction. Internally, Kim Ilsung was partially deified by the North Koreans as an image of friendly father through charismatic speech and close contact with residents[5].

In conclusion, Kim Ilsung used the power and fear of *North Korean People's Army* to establish Juche Ideology, eliminate enemies, and promote internal stabilization based on supports from North Koreans.

3. The Role of North Korean People's Army in Kim Jungil Regime

3.1. Stabilization of hereditary rule

After Kim Ilsung's long-term rule over 40 years, Kim Jungil completed the long succeeding training and became the supreme leader of North Korea. As Kim Jungil was trained as a successor for a long time, he smoothly took over the regime.

Kim Jungil promoted a new political ideology called "Military First Policy". Military First Policy stabilizes internal system, exercises influence on overall society as the executing organization directly under Kim Jungil, and utilizes military force on industries and foreign currency earning. Such Military First Policy emerged as Kim Jungil was attracted to loyalty and driving force of *North Korean People's Army* as he took the key military post. Also, Kim Jungil felt difficulties in unity and control over the party and North Koreans due to continuing financial difficulties and natural disasters after taking over the regime[6].

After the collapse of socialist states in Eastern regions in 19902 and contradiction in planned economy system, North Korea couldn't get supports from the Soviet Union and China. Although the power was peacefully transferred to Kim Jungil, North Korea faced external issues from international situation, natural disasters, and the severe famine. This made Kim Jungil regime to stabilize the regime as the priority task. Kim Jungil felt that Kim Ilsung's party-based ruling regime cannot sustain internal stabilization. In response, Kim Jungil suggested Military First Policy as the new ruling system.

Kim Jungil used the *North Korean People's Army* under his control to block opposition from political parties and North Korean residents. He also made the *North Korean People's Army* to operate national industries and earn foreign currency to revive the economy.

3.2. Excessive expansion of North Korean people's army and militarization of North Korea

Kim Jungil continued his regime under Military First Policy by ignoring the party-military relationship in socialist states.

Kim Jungil regime's one of the characteristics is the military-centered dictatorship and Kim Jungil directly controlled the overall affairs focusing on National Defense Committee without holding or operating multiple conference systems in the parties[7]. North Korea explains that Military First Policy is "A political method for solving issues regarding revolution and construction under military-first principle and for promoting overall socialist works by having *North Korean People's Army* as the base of revolution"[8].

Kim Jungil's ruling style naturally led to increased political influence of *North Korean People's Army*. As military personnel took more positions in committees and *North Korean People's Army* had higher economic interests from earning foreign currency, the military expansion became remarkable in the North Korean society. Furthermore, Kim Jungil continuously developed nuclear weapon through military to sustain North Korean regime and gain financial support by encouraging conflict with South Korea. As a result, nuclear development and military first policy made the military as the supreme enforcement agency without any competitor. This led to excessive increase in authority and interests of *North Korean People's Army* and resulted in the military regime for Kim Jungil's dictatorship.

4. Role of North Korean People's Army in Kim Jungeun Regime

4.1. Meaning of control and reduction of military

After Kim Jungil passed away in 2011, Kim Jungeun soon took over the regime and returned to a normal socialist state's party-military relationship. *North Korean People's Army*

played a significant role in Kim Il-sung's establishment of regime and Kim Jong-il's overcoming of economic and regime crisis. While Kim Jong-il executed Military First Policy, Kim Jong-un regime returned to Workers' Party-centered regime. Such phenomenon is found in controlling and reducing the *North* Korean People's Army such as military personnel's frequent demotion and reinstatement, ousting, and personnel replacement to empower the Workers' Party of Korea and state authorities.

While Kim Jong-il was trained for a long time as a successor, Kim Jong-un had to take over regime without getting enough training. Thus, Kim Jong-un might have perceived that *North* Korean People's Army could threaten his power. The position and role of *North* Korean People's Army are threatening and inevitable in dictatorship. In response, Kim Jong-un blocks such threatening by retiring and purging out key military personnel under excuses[9]. Kim Jong-un controlled and reduced the *North* Korean People's Army under the idea that excessively enlarged *North* Korean People's Army with varying interests from Kim Jong-il regime would largely threaten his dominance.

Another reason for Kim Jong-un's control and reduction over the *North* Korean People's Army is to suggest his own ruling style. Like Juche Ideology of Kim Il-sung and Military First Policy of Kim Jong-il, he needed his own ruling style. This was to make *North* Korean parties and *North* Koreans to perceive that the transfer of power of legitimate and to deify him like Kim Il-sung and Kim Jong-il. In response, Kim Jong-un imitated Kim Il-sung's public friendly style rather than Kim Jong-il's fearful and authoritative Military First Policy. Kim Jong-un attempted close contacts with *North* Korean residents and tried to resemble the image of Kim Il-sung. In addition, the names of positions and operation methods for Workers' Party of Korea are similar to Kim Il-sung regime[10].

Kim Jong-un controlled and reduced the *North* Korean People's Army to consolidate his

own power from the early stage. Based on such control and reduction over *North* Korean People's Army, Kim Jong-un changed excessive military-centered system which might threaten him into a party-centered system.

4.2. True meaning of declaration on denuclearization

In 2018 New Year's address, Kim Jong-un threatened the United States and South Korea by saying "Whole American states are within our range of nuclear strike and I always have a nuclear button on my desk at office". After shooting Hwasong-15 successfully, Kim Jong-un declared completion of nuclear power and emphasized *North* Korea as a nuclear state internally and externally. As previous researches pointed out, Kim Jong-un tries to relieve sanction and pressure on *North* Korea under the excuse of blocking military treats from the United States and improving North-South relationship[11].

In 2018 New Year's address, *North* Korea threatened South Korea and the United States by declaring nuclear power of *North* Korea. In PyeongChang Olympic, Kim Jong-un declared denuclearization by encouraging conciliation between *North* and South Korea to improve North-South relationship. The purpose of declaration on denuclearization is to make the United States perceive *North* Korea as a nuclear state, sign a peace treaty to secure regime, and relieve sanctions against *North* Korea. Nuclear weapon and missile are the prides of the *North* Korean People's Army and they were used as propaganda for making *North* Korean residents to perceive stable regime and strong and prosperous state. Kim Jong-un's declaration on denuclearization could have a huge influence on *North* Korea which had been sustained through *North* Korean People's Army since Kim Il-sung regime and it could largely threaten the Kim Jong-un regime. To understand why Kim Jong-un would bring treats upon him, it is necessary to understand the meaning of nuclear weapon to Kim Jong-un and *North* Korea.

Kim Jong-un says that *North* Korea stands

against Trump's hardline policy toward North Korea and development of missile to protect the principle of 'Protecting Regime At All Costs' and that North Korea is on an equal footing with the United States. North Korean nuclear weapon is the mean to stand against the United States as the world's strongest nation. Also, North Korean nuclear weapon relieves sanctions toward North Korea and promotes North-South cooperation to overcome the financial crisis. Furthermore, North Korean nuclear weapon holds strength in converting the expense of storing conventional weapons into economic field. However the ultimate goal of nuclear weapon is to stabilize the regime and secure the system[12]. Considering the 3 North-South Summits and two North-US meetings regarding Kim Jungeun's declaration on denuclearization, North Korea isn't showing significant movement until now. Kim Jungeun uses nuclear weapon for propaganda to stabilize the regime and enhance negotiating power by threatening South Korea and the United States.

5. South Korea's Response to North Korea's Changes

In the case of the former Soviet Union, the military was thoroughly subordinate by the Communist Party. The decision on all military affairs was made by the party, and the party political office oversaw the defense. China has a real defense-related authority by the Party Central Military Commission. In other words, both the Soviet Union and China control the party. The basic model of the Party-military relationship of the normal socialist state system is that of the former Soviet Union and China. As the Kim Jong-un regime enters, it seems to follow the basic model of the party-military relationship between the former Soviet Union and China. However, the biggest difference in North Korea is that the military is not directly controlled by the Party. The North Korea military is the army of its leader and exists in terms of personal security and maintenance of power. And there is no real change in the Kim Jong-un regime either.

The details of military use by the North Korea regime are shown in <Table 1>.

Table 1. Use of military forces by regime.

Model	Surface role	Practical application
Kim Il-sung	The army of the party	Establishment of regime maintenance of the system regime propaganda
Kim Jung-il	Military first	Create a fear maintenance of the system leading infrastructure industry
Kim Jung-eun	The army of the party	Use of international Negotiations external threat regime propaganda

It is too early to judge the party-centered state system, which the Kim Jong Un regime has ostensibly shown so far, as a shift to a normal socialist country. This is because they continue to use nuclear force demonstrations that have mobilized the military for their own interests.

South Korea has a record of wasting national power several times in North Korea disguised peace offensive. This is an important historical resource for establishing a policy toward North Korea in the future. Also, we should refrain from foolish responses that support first and expect change. To this end, South Korea will have to make sure that North Korea makes a substantial change before inducing support and change. South Korea should discuss with the international community the mitigation or withdrawal of sanctions against North Korea, and show a thorough cutoff from North Korean military threats. In conclusion, it is necessary to clearly understand the actual changes of the North Korean military and the Kim Jong-un regime intention to abandon its nuclear program, and induce economic support and change for North Koreans.

6. Conclusion

Kim Il-sung established the North Korean regime by utilizing the North Korean People's Army. This is the military-first dictatorship differentiated from general socialist states. During the Kim Il-sung regime, the North Korean People's Army played a crucial role in establishing the regime and consolidating the Juche Ideology by purging out the political opponents. In the collapse of planned economy system and fall of socialist states, the North Korean People's Army protected the regime and participated on overall national industries to show its aspect of military state to the world. On contrary, Kim Jong-un is promoting the aspect of a normal party-centered socialist state by reducing the power of North Korean People's Army. However, Kim Jong-un is pretending to reduce military power and turn into a normal state to make the United States secure the North Korean regime and break away from sanctions against North Korea. If North Korea continuously fails to gain interests from negotiation with South Korea and the United States, Kim Jong-un would use nuclear weapon and missile to threaten and pressure South Korea and the United States like Kim Il-sung and Kim Jong-il did. The military system continuing from the establishment of North Korean regime still stays firm and the North Korean People's Army will be power of Kim Jong-un in the future. Thus, South Korea should identify the fundamental intentions of Kim Jong-un and carry out negotiations with North Korea accordingly.

7. References

7.1. Journal articles

- [9] Kim JM. An Analysis on the Change of Entrance in Kim Jong Eun's Government. *Sejong Policy briefing*, 2, 1-27 (2018).
- [10] Jung SJ. Evaluation of 7th North Korean Workers Party Convention. *The Political Situation and Policy*, 6, 8-11 (2016).
- [11] Kim JM. High-level Talks between the Two Koreas, Pyeongchang Winter Olympic

Games and North Korea's Denuclearization. *The Political Situation and Policy*, 2, 8-12 (2018).

- [12] Kim DY. The Pathways of Economic and Nuclear Armament and Changes in North Korea's Defense and Military Strategy. *Modern North Korea Studies*, 18(2), 45-62 (2015).

7.2. Thesis degree

- [5] Song SK. A Study on the Change of North Korea Military Strategy and the Response Strategy of Korea Army. Chosun University, Doctoral Thesis (2018).
- [6] Park JT. A Study on Kim Jong-il's Military First Politics. Wonkwang University, Master's Thesis (2011).

7.3. Books

- [1] Jung SI. North Korean People's Army: Status, Organization, Part. Hanul (2007).
- [2] Yi DK. Why Don't the North Korean People's Army Make a Coup. Hanul (2009).
- [3] Jung SI. North Korean People's Army: Status, Organization, Part. Hanul (2007).
- [4] Oh KD & Ralph C. North Korea through the Looking Glass. L&J (2018).
- [7] Choi JU & Park YJ. North Korean System and Policy. Myungin (2015).
- [8] Kim H & Ko B. General Kim Jong-il of the 21st Century Sun. Pyongyang (2000).

7.4. Additional references

- [11] <https://missilethreat.csis.org/> (2019).

Author

Park Jong-tak / Chosun University Doctoral Course

B. A. Wonkwang University

M.A. Wonkwang University

Research field

- A Study on Kim Jung-il's Military First Politics, WonKwang University, Master's Thesis (2011).
- Transition of a Structure of the Military Authorities Personnel Within a Regime of Kim Jung-un, The Journal of Humanities and Social Sciences 21, 10(5) (2019).

Major career

- 2004~2010. Korea Army 31nd Infantry Division, Personnel Management Officer
- 2010~2012. Chodang University, Professor

Publication state: Japan
ISSN: 2423-8775

Publisher: J-INSTITUTE
Website: <http://www.j-institute.jp>

Corresponding author
E-mail: khs1030r@hanmail.net

Peer reviewer
E-mail: military@j-institute.jp

<http://dx.doi.org/10.22471/military.2019.4.2.25>

© 2019 J-INSTITUTE

A Study on the Integrated Protection System against HEMP Threats with THIRA Process

Kwon Hyuck-shin

Seoul National University of Science and Technology, Seoul, Republic of Korea

Abstract

With the advent of hybrid warfare in the 21st century, High-altitude Electromagnetic Pulse(HEMP) is seen as a more revolutionary and ultimate weapon than the German Blitzkrieg during World War II. The background of this assessment is the confidence that HEMP can easily destroy the host country's infrastructure as a relatively low cost and high efficiency weapon system compared to existing WMDs. Domestic and foreign military experts estimate that North Korea and other major Northeast Asian countries have the capabilities to manufacture and launch EMP bullets. The damage from HEMP attacks is expected to reach catastrophic levels as the host country's infrastructure becomes more scientific and advanced. However, the HEMP protection system is applied only to specific facilities and equipment, and the consequence management(CM)system that responds to the HEMP situation is considered to be ineffective because it is suspended in the extension of the WMD response system.

This study has been carried out by applying the THIRA process, a disaster management system used by the US Department of Homeland Security, in order to prepare for an integrated protection system that can minimize damage and recover quickly in an EMP situation. The research procedures and products are as follows: 1)based on time and cause of damage, HEMP damage phases are classified into 5 stages and realistic worst-case scenarios are presented phase by phase; 2)the risk assessment for the national infrastructures has been conducted using the metrics prepared based on the probability of HEMP attack and the intensity of damage; 3)goals for consequence management and National capability targets for HEMP protection have been identified; 4)and Integrated protection measures against the HEMP threats have been developed based on the national disaster management system.

The products presented in this study are only the results of establishing research procedures and finding directions for the construction of the HEMP protection system. The research procedures and next research subjects proposed here by the researcher are expected to be the foundation for constructing a more effective HEMP protection system through subsequent studies.

[Keywords] Protection, High-Altitude Electromagnetic Pulse(HEMP), Threat & Hazard Identification & Risk Assessment(THIRA), Chemical-Biological-Radical and Nuclear(CBRN), Consequence Management(CM)

1. Introduction

Hybrid wars, also called ambiguous wars, nonlinear wars, and next-generation wars, are changing the patterns and rules of war in the 21st century[1]. The characteristics of the new-generation war, as defined by the

“Gerasimov Doctrine”, are that in ambiguous situations, it destroys the national infrastructure and ultimately paralyzes the hostile country through the war called Cybergeddon or Black-out War, not only in the area of contact but also in deep areas.

Military experts[2][3] argue that the Hezbollah war against Israel's regular troops, the Crimean Conflict, the Afghan war, and the Iraq war were all hybrid wars.

Some terrorist groups and so-called "rogue states" are waging this Black-Out War in the real world to achieve their political and military goals. Nuclear EMPs are considered the ultimate weapon for carrying out a Black-Out War, which is supposedly more revolutionary than Germany's blitzkrieg during World War II[4]. North Korea has focused on bolstering its asymmetric forces which are currently centered on nuclear and ballistic missiles. They have been considered capable of manufacturing and firing EMP bombs since 2016[5].

HEMP(High-altitude Electromagnetic Pulse) attacks are expected to inflict even more damages as the hostile country's infrastructure becomes more advanced and networked. This may eventually throw the 21st century back into the "stone age". However, HEMP protection systems are equipped only at facilities that are essential at the national level because of scientific and technological limitations and astronomical protection costs. Moreover, the Consequence Management(CM) system for a HEMP situation is not integrated and developed at the national level, and even HEMP protection seems to be understood as part of the protection system for CBRN threats.

The purpose of this research is to find a framework for constructing a Consequence Management System to be carried out under the HEMP situations. This study has been conducted by applying the THIRA(Threat & Hazard Identification & Risk Assessment) process, which is used by the US Department of Homeland Security as a disaster management system. The results of this study suggest that the scenarios for HEMP damages, the HEMP risk assessment, the capability targets for HEMP protection, and the direction of HEMP integrated protection system be focused on prevention, preparedness, response and recovery. It is hoped that these findings will provide a

useful framework for constructing a Consequence Management system in order to minimize damages and recover quickly under the HEMP attack situation.

2. Previous Researches

2.1. Characteristics and protection standards of HEMP

Types of EMP are classified into artificial EMP and natural EMP according to the cause of occurrence. Artificial EMP can be further classified into nuclear EMP(HEMP) and non-nuclear EMP according to the delivery system[6]. HEMP(High-altitude Electromagnetic Pulse) is a powerful electromagnetic wave generated into the magnetic field of the earth as gamma rays and X-rays generated by the nuclear explosion outside the atmosphere pass through the atmospheric layer[7].

HEMP cause a catastrophic damage on equipment and facilities in the wide frequency range, which can be classified into early, middle, and late phases depending on the time, and the types that causes the damage can be classified into conduction and radiation[8]. Methods of protecting facilities and equipment against radiated HEMP include shielding facilities and handling points of entry(POE) such as doors. On the other hand, methods for protecting against conductive intrusion are used to filter or ground electric wires and communication lines that enter the facility[6].

The HEMP protective action levels set by the US Department of Homeland Security are divided into four categories based on the ALARP(As Low As Reasonably Practicable) level. The agency also provides protection and resilience guidelines for critical infrastructure and equipment. According to this guidelines, military protection standards are applied at level 4, the highest level of protection, and civil protection standards are applied at level 3, which is one level below[9].

2.2. Disaster management system and THIRA process

Representative models for developing a disaster management system at the national level are the THIRA process in the United States, the National Risk Register(NRR) and the Community Risk Register(CRR) in the UK, and the All Hazard Risk Assessment(AHRA) in Canada[10]. The THIRA process is a system that results from the U.S. Department of Homeland Security's redesigning of its disaster management system in the wake of the Sept. 11 terrorist attacks in the U.S. It has developed the concept of establishing a Capability-Based Plan(CBP) that the U.S. Department of Defense and the U.S. military used as a planning and management system to meet disaster management. THIRA is a system that sets out goals to be addressed in an uncertain environment in the event of a disaster. It prioritizes activities and resources to achieve them, and continually improves the capabilities required[11].

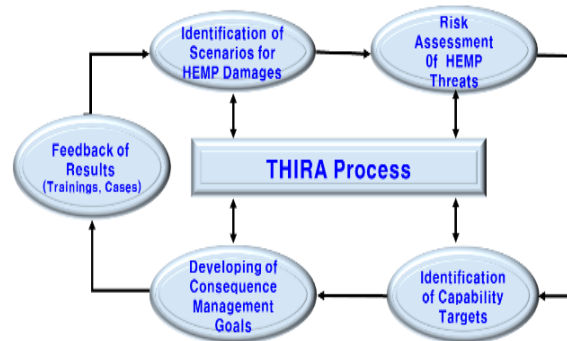
CBP is a system that has the following usefulness 1)it is possible to set mid-to-long-term disaster management goals in terms of strategic management; 2)capability analysis enables efficient budget investments for various disaster management projects; 3)interorganizational collaborations can more accurately reflect local risks; 4)and repetitive trainings and disaster experiences promote organizational learning[12]. CBP is not a panacea[13], however, it is important to make good use of the system while supplementing it to suit its own situation.

3. Research Methods and Procedures

The framework of analysis developed by the researcher to construct a integrated protection system against HEMP is shown in <Figure 1>. This study applied the THIRA process and proceeded as follows: 1)identification of realistic worst-case scenarios for damage prediction under the HEMP situation; 2)risk assessment of the subjects to be

protected based on the likelihood and intensity of the HEMP attack; 3)identification of capability targets for HEMP protection; 4)and derivation of consequence management goals for the integrated protection against HEMP. The research mainly used analysis of the literature and discussion of experts.

Figure 1. The framework for the research.



4. Results

4.1. Identification of the worst-case scenarios for damage prediction

The first step in constructing an integrated protection system is to identify a time-based damage scenario that would be expected if a HEMP attack occurred. Damage phases caused by HEMPs can be classified into early-time, intermediate-time, and late-time HEMP depending on the time when the HEMP signal is conducted or radiated in the affected area or infrastructures. The descriptions of each HEMP are summarized in <Figure 2>.

Figure 2. The descriptions of HEMPs.

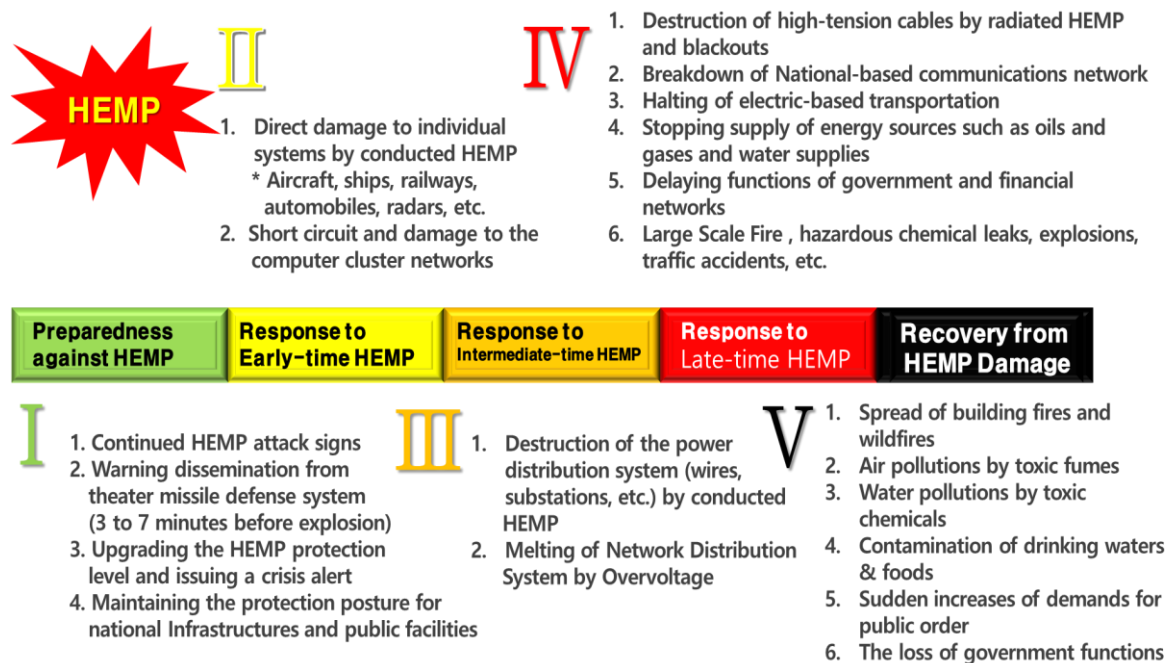
HEMP	Attribute	Description
Commonness	Cause Warning Footprint	Adversarial threat Strategic: unknown, Tactical: none to several minutes Regional to continental depending on height of burst
E1 (Early-time HEMP)	Effects Duration Equipment at Risk	High peak field – quick rise time Less than a 1 microsecond Telecommunications, electronics and control systems, relays, lightning arrestors
E2 (Intermediate-time HEMP)	Effects Duration Equipment at Risk	Medium peak field Less than 10 millisecond Lightning : power lines and tower structures – “flashover”, telecommunications, electronics, controls systems, transformers.
E3 (Late-time HEMP)	Effects Duration Equipment at Risk	High peak field – quick rise time Less than a 1 microsecond Transformers and protective relays – long run transmission and communication - generator step-up transformers

Note: Table above adapted from U.S. National Coordinating Center for Communications(NCC), Electromagnetic Pulse(EMP) protection and resilience guidelines for critical infrastructure and equipment[14].

The scenarios for damage prediction of HEMP as shown in <Figure 3> have been developed through expert discussions. The stages

for HEMP damages have been divided into five in conjunction with the national disaster management system.

Figure 3. Scenarios for HEMP damage prediction.



Stage I(Preparedness against HEMP)refers to measures taken in the Theater Ballistic Missile Defense Posture just before the HEMP attack is launched. Stage II(Response to early-time HEMP), Stage III(Response to intermediate-time HEMP) and Stage IV(Response to late-time HEMP) correspond to the response phase of the national disaster management system. These phases are intended to implement the necessary protection measures according to the U.S. DHS’s “Electromagnetic Pulse(EMP) Protection and Resilience Guidelines for Critical Infrastructure and Equipment”(2019)[14] against each type of HEMPs described in <Figure 2>. Stage V(Recovery from HEMP damage) is the recovery phase of the national disaster management and includes the process of taking steps to effectively respond to secondary damages such as fires, explosions and blackouts caused by HEMP, and to recover quickly from these situations.

4.2. Risk assessment

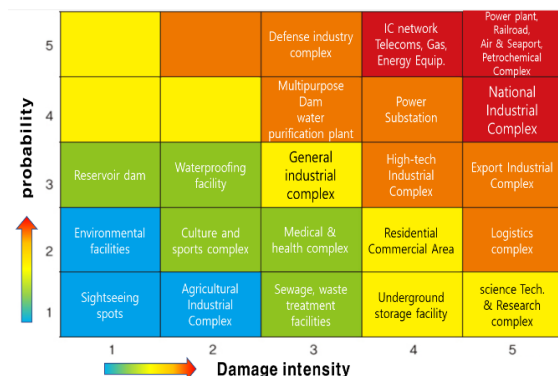
The second step for constructing a HEMP protection system is to assess the predicted

risks in the event of a HEMP attack using the 5 × 5 matrix prepared in advance. The 5 × 5 matrix is a chart divided into five grades based on the probability of HEMP attack and the intensity of damage. The expert group identified the infrastructures or areas to be protected from the HEMP threat through qualitative evaluation. They were divided into 25 groups(grid) as shown in <Figure 4>.

The second step for constructing a HEMP protection system is to assess the predicted risks in the event of a HEMP attack using the 5 × 5 matrix prepared in advance. The 5 × 5 Matrix is a chart divided into five grades based on the probability of HEMP attack and the intensity of damage. The expert group identified the infrastructures or areas to be protected from the HEMP threat through qualitative evaluation. They were divided into 25 groups(grid) as shown in <Figure 4>. As the result of the risk assessment, national infrastructures related to electricity, telecommunications, energy and transportation are

evaluated as the high-risk groups for HEMP attacks.

Figure 4. Risk assessment of HEMP threats.



4.3. Identification of capability targets(CTs) for HEMP protection

The next step is to identify the Capability Targets(CTs) for HEMP protection. Methods of identifying CTs include expert discussions and questionnaire surveys for workers in the relevant organizations or sectors. This study identified CTs by referring to the core capabilities in the government disaster and safety management and standardized targets in US FEMA, together with expert discussion results.

Figure 5. Goals for CM & national capability targets for HEMP protection.

Target Capabilities	Target Capabilities List
Securing War Sustainability	<ol style="list-style-type: none"> 1. Construction of protection facilities and securing of equipment against HEMP 2. Preparation of HEMP-related laws and procedures 3. Establishment of HEMP protection specialized organization
Minimize HEMP damages	<ol style="list-style-type: none"> 1. Reinforcement of early warning system 2. Strengthening of emergency and relief system 3. Preparation of emergency electrical supply system 4. Constructing of emergency communications network system 5. Supplementation of medical support system
Quick recovery	<ol style="list-style-type: none"> 1. Preparation of evacuation systems 2. Constructing of recovery systems
Maintaining government functions	<ol style="list-style-type: none"> 1. Developing of damage assessment & control system 2. Constructing of national crisis management system 3. Establishing of consequence management system

The CTs for HEMP protection in <Figure 5> is a set of identified CTs in conjunction with the national missions and visions regarding HEMP protection. These targets may help relevant personnel better understand the correlation among the Capability Targets. They

explain how sectoral activities for HEMP protection will play a role in securing their CTs.

4.4. Developing of Integrated protection measures against the HEMP threats

The final stage for constructing a protection system against HEMP threat using the THIRA model is to develop the civil-government-military integrated protection measures. Among the CTs identified in stage 3, the targets that are distinct from the already prepared WMD protection system selected in the first step of the stage 4. The measures to be taken exclusively in the preventive and preparedness phases to achieve the targets developed in the following step. The integrated protection measures for consequence management against HEMP threats are presented in <Figure 6>.

The reason for this limitation is that the measures to protect HEMP are distinct in the prevention and preparedness phases compared to those of CBRN, but the response and recovery phase are very similar.

Figure 6. The integrated protection measures for consequence management against HEMP threats.

Laws, Institutions, Government Organizations	National Crisis Management Systems
<ul style="list-style-type: none"> • Establishing integrated legislations and guidelines for WMD threats, including HEMP • Maintaining linkages with wartime legislations and peacetime laws for disaster management and safety • Development of governmental organizations for integrated response and support on a national level 	<ul style="list-style-type: none"> • Complementation of early warning and alarm systems • Reinforcement of safety facilities and equipment • Vertical and horizontal integration of the HEMP-related plans • Supplementation of command control systems • Constructing international cooperation systems • Establishment of regional damage control systems

Protective Facilities & Evacuation Systems

- Establishment of standards for complex protection facilities
- Securing reserve facilities and equipment against HEMP attack
- Strengthening of the HEMP protection functions of the Civil Defense evacuation facilities
- Reinforcement of the evacuation system (evacuation priority, time required, determination of facility needs, etc.)

Consequence Management(CM), Education & Training

- Reinforcement of damage assessment and control systems
- Constructing of integrated support systems of national functions against HEMP damages
- Quick recovery of public facilities and provision of emergency repair capacity
- Reinforcement of Civil Defense Education and Civil-Government-Military integrated training

5. Conclusions

With the advent of the concept of hybrid war in the 21st century, the HEMP is recognized as the ultimate and most revolutionary weapon. This study has attempted to construct an integrated national protection system against HEMP threats. The study has been conducted according to the model developed by researchers based on the THIRA process used by the U.S. Department of Homeland Security as a disaster management model.

The results of the research are only a suggestion of the research procedure and direction for constructing HEMP protection systems. Therefore, it is expected that the following studies will be conducted to establish a more theoretical and practical HEMP protection system: 1)threat analysis of HEMPs differentiated from WMD; 2)case studies concerning the recent massive blackout events or battlefields with HEMPs; 3)identification and verification of realistic worst-case scenarios under HEMP situations; 4)identification and verification of CTs for HEMP protection; 5)development of risk assessment techniques for HEMP; 6)and development of HEMP protection criteria and ALARP, etc.

Subsequent studies and practical protection measures related to HEMP are expected

to mitigate the current vulnerabilities: optimism concerning HEMP attacks; constraints on HEMP protection technologies; high costs of HEMP protection systems; blanket application of full protection criteria; and consequence management without HEMP characteristics being considered.

6. References

6.1. Journal articles

- [1] Gerasimov V. The Value of Science is in the Foresight: New Challenges Demand Rethinking the Forms and Methods of Carrying out Combat Operations. *Military Review*, 96(1), 23-29 (2016).
- [3] Glenn RW. Thoughts on Hybrid Conflict. *Small Wars Journal*, 2, 1-8 (2009).
- [5] Park JW. North Korea's EMP Threat and South Korea's Response. *Korean Journal of Military Affairs*, 5, 93-129 (2019).
- [6] Choi EH. Development Trends of High-power Microwave Evacuation Device and Electromagnetic Pulse Ammunition. *Journal of Power Electronics*, 9(1), 20-25 (2004).
- [10] Yoon SH & Shin JD & Park SY & Won JY & Im DH. A Study for Improvement Direction and Reality of Disaster Management System in Korea - A Review Focused on Basic Safety Management Plan. *Crisisonomy*, 12(9), 97-106 (2016).
- [11] Kim YJ & Lim SB. A Study of the Capability-based Planning Approach to Emergency Management in Local Communities. *Korean Journal of Public Administration*, 56(3), 103-129 (2018).
- [12] Caudle S. Homeland Security Capabilities-based Planning: Lessons from the Defense Community. *The Journal of the NPS Center for Homeland Defense and Security*, 1(2), 1-21 (2005).
- [13] Johnson KA & Cain W. Adaptation and Application of Federal Capabilities-based Planning Models to Individual States: State of Colorado Case Study. *Journal of Homeland Security and Emergency Management*, 7(1), 1-11 (2010).

6.2. Thesis degree

- [7] Yoon SH. A Study on the EMP Shielding Effectiveness of Circular Multi-waveguide for the Fluid Supply. Kwangwoon University, Doctoral Thesis (2015).

6.3. Books

- [2] Hoffman FG. Conflict in the 21st Century: The Rise of Hybrid Wars. Potomac Institute for Policy Studies (2007).

6.4. Additional references

- [4] Woolsey ARJ & Pry PV. Heading Toward an EMP Catastrophe. Statement for the Record Before the Senate Homeland Security and Governmental Affairs Committee (2015).
- [8] IEC 61000-1-5, Electromagnetic Compatibility(EMC)- Part 1-5, General-high Power Electromagnetic(HPHEM) Effects on Civil Systems (2004).
- [9] MIL-STD-188-125-1, High-altitude Electromagnetic Pulse(HEMP)Protection for Ground-based C4I Facilities Performing Critical, Time-urgent Missions, Part 1 Fixed Facilities (2005).
- [14] U.S. National Coordinating Center for Communications. Electromagnetic Pulse(EMP) Protection and Resilience Guidelines for Critical Infrastructure and Equipment (2019).

Author

Kwon Hyuck-shin / Seoul National University of Science and Technology Researcher
B.A. Chonnam National University
M.A. Kyunghee University
Ph.D. Seoul National University of Science and Technology

Research field

- The Study on CEO Leadership Characteristics in Public Firm based on Korean Style Leadership Framework: The Case of Cho, Hwan-ik in KEPCO, Journal of Creativity and Innovation, 10(4) (2017).
- Creating Sustainable and Climate Shared Value in Public Institution: Lessons from a Case of Korea Army Cadet Military School, Sustainability, 11(14) (2019).

Major career

- 2014~2016. The 31st Infantry Division, Commanding General
- 2017~2019. Army Cadet Military School, Commandant