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ROK Navy's Response to China's Naval Modernization:

Based on Command, Control, Capability, and Capacity Analysis Framework

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Ⅰ. Introduction

China, which once had a huge but low-tech military, has grown to be a remarkably high-tech military power not only in East Asia but also in the world. The growth of the People's Liberation Army Navy (PLAN) specifically is one of the most considerable issues in East Asia since its growth is overshadowing other countries' growth in terms of both quantity and quality. Physically, the military expenditure of China has been dramatically increasing since the 2000s[1] and the PLAN has constructed high-tech weapons such as an aircraft carrier, quasi-Aegis destroyers, and nuclear submarines. Strategically, it has changed its strategic concept from "near-coastal defense" and "near seas active defense" to "far seas operations,"[2] which makes it clear that the PLAN is aiming to have a "blue-water navy" in the near future.

Why is the PLAN's growth important to the Republic of Korea Navy?

First of all, China is one of the geographically closest countries to South Korea, which face each other across the Yellow Sea, the only connection between two countries. Second, the EEZ boundary in the Yellow Sea has not been clarified by the two countries. As the distance between two countries is not satisfied the condition of the EEZ in accordance to the *United Nation Conventions on the Law of the Sea* (UNCLOS), two countries have conducted common efforts to use

1) "SIPRI Military Expenditure Database," Stockholm International Peace Research Institute, available at https://www.sipri.org/databases/milex (accessed on March 21, 2019).

2) Nan Li, "The Evolution of China's Naval Strategy and Capabilities: From "Near Coast" and "Near Seas"to "Far Seas"," in *The Chinese Navy: Expanding Capabilities, Evolving Roles*, ed. Philip C. Saunders, Christopher D. Yung, Michael Swaine, and Andrew Nien-Dzu Yang (Washington D.C.: National Defense University Press, 2011), p.109.

maritime resources peacefully. Despite these efforts, illegal fishery of Chinese fishing boats has been a serious problem, and it has provoked several diplomatic conflicts.

Second, China has shown its desire for territorial expansion in the Yellow Sea as well as in the South China Sea (SCS) and the East China Sea (ECS). For the last several years, PLAN assets have crossed the midline between China and ROK, 124 degrees east longitude, more than 100 times and established numerous buoys suspected for military use in the Yellow Sea. Also, China has sent coast guard assets including ships and aircraft in the vicinity of Ieodo repeatedly, which has been interpreted as laying the groundwork for future EEZ negotiations or attempting to signal to the U.S. that China could push American military power out of the region.[3)]

Third, the stability of the sea lane of communication (SLOC) is crucial for the survival of South Korea. South Korea's economy relies heavily on exports, and 99% of exports have been conducted via sea lane.[4)] The SCS and the ECS, in which China is facing maritime conflicts with neighboring countries, are on the "oil SLOC" of South Korea, and South Korea's survivability would be in danger if the "oil SLOC" were to be blocked because of a conflict between China and another state.

The Framework: Command, Control, Capability, and Capacity

In order to evaluate China's naval modernization and to compare it with the ROKN, the PLAN and the ROKN will be analyzed by Robert L. Thomas's the command, control, capability, and capacity framework since

3) Min-Seok Lee, "China appears on the West Sea and the sky of the East…Presents its Strength as the U.S. should watch it," *Chosun Ilbo*, March 2, 2018 (In Korean).

4) Michael McDevitt, "The Maritime Relationship," in *The US-South Korea Alliance: Meeting New Security Challenges*, ed. Scott Snyder (Boulder: Lynne Reinner Publishers, 2012), p.30.

we can analyze both the quality and quantity through the framework. There are lots of analyses focusing on the numeric size of the military, however, qualitative dimensions such as the military strategy and degree of proficiency is also essential to measure the military power.

Command is "the nation's political desire to support military operations" as expressed "in the Rules of Engagement they apply." *Control* is the "ability to communicate at various levels of classification," which means the capability of the command, control, communication, computer, and Intelligence (C4I) system of the military. *Capability* is the "quality and effectiveness of their platforms, weapons, intelligence apparatus and the proficiency of their operations," and *capacity* is "the quantity of their platforms, weapons, intelligence assets and their ability to sustain them in prolonged operations with logistics and maintenance."[5]

By analyzing these four aspects of the PLAN and ROKN, one can appreciate not only the numeric size of China's military but also its qualitative aspects such as the military strategy, doctrine, and capabilities of the PLAN and ROKN.

Ⅱ. Modernization of the PLAN

1. Command

When the People's Republic of China (PRC) was founded in 1949, the PLA's most concern was small-size amphibious operations of Kuomintang (KMT) forces. Also, during the Chinese civil war, Mao Zedong declared "people's war" strategy, and it became the main strategy of the PLA in the 1950s. Mao's strategy was based on a

5) Robert Thomas, "Taking Stock of US Military Alliances in Asia," *Global Asia*, Vol .12, No.4 (Winter 2017), pp.15-16.

strategy of "luring the enemy in deep," fighting the enemy deep inside of its territory rather than at the frontline. In this regard, the PLAN focused on the land-based defense and counter-amphibious- landing operations rather than conducting outer sea operations.[6]

This strategy was changed when Liu Huaqing, a PLAN admiral and a former Vice-chairman of the Central Military Committee (CMC) in the 1980s, ordered the PLAN to plan a long-term strategy for the naval development. According to Liu's new strategy, the PLAN conducted "coastal defense" before the 1980s, but it would be shifted to "offshore defense" by 2000, and finally become a "blue-water navy" by 2050.[7] Nowadays, the PLAN pursues the "hybrid strategy of 'near sea defense' and 'far seas protection'" by conducting operations beyond the first island chain.[8] China expressed its maritime strategy concept as "the combination of 'offshore waters defense' with 'open sea protection'" based on "active defense" strategy in *China's Military Strategy 2015*.[9] This strategy aims to prevent the approach of the adversary by attacking them far from China (anti-access or open sea protection). When it fails, and the adversary comes close to the mainland China enough to attack them with land-based weapons, attempt to "deny their freedom of operational and tactical actions" by the combination of the joint military force (area-denial or offshore waters defense).[10]

Moreover, China officially announced that China's armed forces would engage in "extensive regional and international security affairs," and humanitarian assistance/disaster relief (HA/DR) mission will be

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6) Li, "The Evolution," p.111

7) Paul H. B. Godwin, "Change and Continuity in Chinese Military Doctrine," in Chinese Warfighting: The PLA Experience since 1949, ed. Mark A. Ryan, David M. Finkelstein, and Michael A. McDevitt (New York: An East Gate Book, 2003), p.43.

8) U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2017* (Washington D.C.: Office of the Secretary of Defense, May 15, 2017), p.24.

9) The State Council Information Office of the PRC, *China's Military Strategy*, May 2015.

10) Michael McDevitt, "China's Far Sea's Navy: The Implications of the 'Open Seas Protection' Mission," *"China as a Maritime Power" Conference*, April 2016, p.2

one of the primary assignments for the PLA.[11] HA/DR missions will be conducted in the far-seas and requires logistics supports capability which the PLAN has not acquired yet. To conduct far-seas operations, to deploy its naval forces into far-seas, and to overcome its lack of logistics support, China began construction of its first overseas base in Djibouti in 2016 and may establish additional bases in China's friendly countries like Pakistan soon. China officially said that its overseas base is designed for supporting Peace keeping operations and the HA/DR missions, but it is evident that this base gives the PLAN logistics supports helpful for far-seas operations regardless of characteristics of operations.

2. Control

Until the late 1990s, the PLAN used outdated telecommunication for controlling its naval assets, and the U.S. DoD evaluated that the PLA's command and control (C2) capability was not satisfying the requirement for joint operations of the PLA. To catch-up this technological gap with the modernized armed forces, the PLA declared to be "informalized," and emphasized preparation for military struggle (PMS) for "winning local wars under conditions of informationization." Moreover, the PLAN's changing strategy from near-seas to far-seas requires the development of C4I capability of the PLAN. The PLAN realized the importance of the far-reach C4I capability when it started to deploy naval vessels to the Gulf of Aden for anti-piracy operation in 2008 and participated in the mission for the evacuation of Chinese citizen from Libya in 2011.[12]

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11) The State Council Information Office of the PRC, *China's Military Strategy*.

12) Andrew S. Erickson and Michael S.Chase, "Informatization and the Chinese People's Army Navy," in *The Chinese Navy: Expanding Capabilities, Evolving Roles*, ed. Philip C. Saunders, Christopher D. Yung, Michael Swaine, and Andrew Nien-Dzu Yang

The rapid growth of civilian information technology also increased the PLA's C4I capability. *China's National Defense in 2010* described that the establishment of Chinese national fiber-optic communications network provided the PLA the improved and reliable communication system, and satellite wireless communication systems made its C4I capability much far-reachable. The PLA setup a new generation information transmission network and established the Integrated Command Platform, analogous to the U.S. Joint Tactical Information Distribution System (JTIDS).[13]

These improvements are expected to "facilitate the decision-making and shorten the command processes" by enhancing commander's situational awareness in near-real time. Flexibility and responsiveness of the PLAN would greatly increase since commanders can control those assets near-real time by "issuing their order to multiple units at the same time."[14]

3. Capability and Capacity

Three aspects of the PLAN's capabilities should be analyzed: power projection, undersea warfare, and surface warfare capabilities. Strike capabilities like land-attack missiles should be organized as the power projection but those are separated based on the platform criteria to emphasize the platform for each capability.

For *power projection* capability, commissioned of the first aircraft carrier, Liaoning is the symbolic affair while its technology is far left behind from that of the US Navy's. Also, China launched its first endogenous aircraft carrier, the Type-001A, in April 2017, as the 68th

(Washington D.C.: National Defense University Press, 2011), p.253.

13) The State Council Information Office of the PRC, *China's National Defense in 2010*, March 31, 2011.

14) U.S. Department of Defense, *Annual Report 2017*, p.58.

commemoration of the foundation of the PLAN. Despite Type-001A is capable of "launching more varied types of aircraft" than Liaoning, on the other hand, it is estimated that many other characteristics of it are similar to Liaoning.[15]

The capability of Liaoning itself is not significant, however, Liaoning has given chances to the PLAN that pilots and deck crews could enhance their capabilities and the PLAN assets could accumulate its tactical, operational experiences with respect to aircraft carrier itself and its strike group.[16] Commissioned of the Type-001A will lead the PLAN to a multi-carrier force, the only navy in East Asia. Furthermore, in 2021, China will launch the third aircraft carrier, Type-002, with catapults and nuclear propulsion system, which make it more USN's CVN-like ship than previous versions. The PLAN eventually aims to acquire up to six aircraft carriers to be able to operate total four aircraft carrier strike group both in the West Pacific and the Indian Ocean.[17]

Since the 1950s, China recognized the importance of nuclear submarine forces and made efforts to acquire the *Undersea warfare* capability, and Mao Zedong emphasized that China "needs to build its own nuclear submarines even if it takes 10,000 years."[18] Based on this keen national interest, China developed its first attack nuclear submarine (SSN), the Han-class or Type 091, in the 1970s. Despite its poor capabilities, Han-class had an important role in the PLAN's history. First, the PLAN was able to accumulate its nuclear submarine operations experience and could build modernized nuclear submarines after that. Second, the Han-class had limited capabilities and was usually operated in the coastal sea, however, it gave strategic advantages to the PLAN.

The Han-class was succeeded by the Shang-class or Type 093 in the 2000s. China operates five Shang-class submarine, and its capability

15) U.S. Department of Defense, *Annual Report 2017*, p.53.
16) Ibid., p.26.
17) Yang Sheng, "2nd carrier almost complete," *Global Times*, February 21, 2017.
18) Li, "The Evolution," p.115.

has been much more improved and carries YJ-18 anti-ship cruise missile (ASCM), which can be launched from a torpedo tube. The PLAN is to build the improved version of the Shang-class, Type 093B guided-missile attack submarine (SSGN) that may give the PLAN a land-attack option from the underwater.

The first SSBN of the PLAN, the Xia-class or Type 092, was operational in 1983. However, it had many deficiencies like submerging sustainability, radiation leakage, and fire control problems. Thus, China planned to develop a new type of SSBN rather than keeping building the Xia-class. The Jin-class or Type 094 submarine equipped with twelve JL-2 SLBMs was commissioned in 2007. The PLAN operates four Jin-class submarines representing "China's first credible, sea-based nuclear deterrent,"[19] and the Type 096 with the JL-3 SLBM will succeed the PLAN's SSBN lineage from the 2020s.

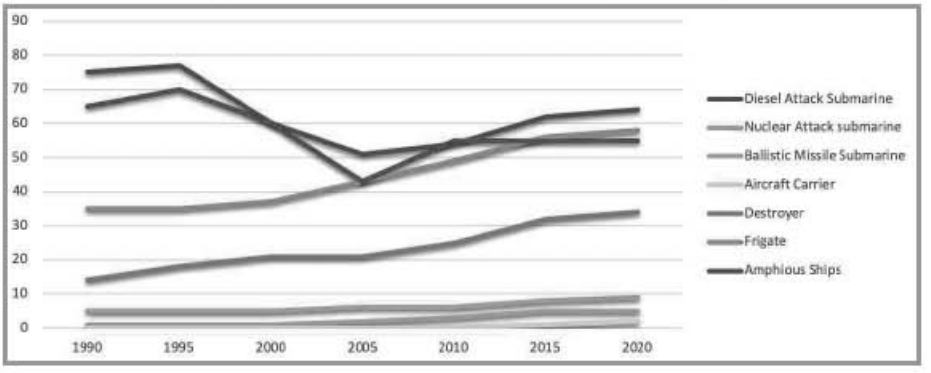
During the early years of the PRC, *Surface warfare* capability was large but inefficient since the PLAN consisted of small ships to conduct "guerilla warfare-type attacks" based on the Mao's military strategy; "people's war."[20] The first generation of destroyers and frigates in the early 1970s, but their operational area was limited due to the lack of anti-air warfare (AAW) and anti-submarine warfare (ASW) capabilities. The PLAN's surface warfare capabilities were skyrocketed since the 1990s and by 2016, the PLAN acquired four Luyang II-class destroyers (Type 052C), a number of Luyang III-class destroyers equipped a multi-purpose VLS, capable of launching anti-suface, -air, an -submarine missiles. The PLAN continues to build the Renhai-class cruiser (Type 055) and more than 20 Jiankai II-class frigates (Type 054A), aiming to be operational in the early 2020s. These new surface ships mount modern combat systems and a phased-array radar, which would increase the AAW capability of the PLAN. Also, the Luyang II-class destroyer currently equipped the YJ-62 ASCM (150nm) and HHQ-9 SAM (55nm), new

19) U.S. Department of Defense, *Annual Report 2017*, p.24.
20) Li, "The Evolution," p.113.

destroyers and cruisers, however, will carry the YJ-18 (290nm), the newest vertically-launched ASCM, and the Jiankai II-class will carries HHQ-16, the vertically-launched newest SAM.[21]

Capacity, the number of assets is easy to figure out given the data with respect to the PLAN fighting power. Figure 1 and 2 show numbers of the PLAN assets in time series. Figure 1 is from 1990 to 2020 by the ONI and Figure 2 is from 2005 to 2017 by the U.S. DoD. On the ONI data, numbers of diesel submarines and amphibious ships have decreased from 1990 to 2005. This is because since China focused on its technical modernization and increasing its capability from the late 1990s, small, old, and low-tech assets were replaced by large, new, and high-tech assets.[22] However, the number of assets has increased since 2005 because the PLAN's replaced new assets has come to the frontline. Thanks to this drastic increase, a total tonnage of the PLAN assets is greater than the tonnages of "the entire French, German, Indian, Italian, South Korean, Spanish or Taiwanese navies."[23]

Figure 1. Numbers of PLAN assets (1990-2020)



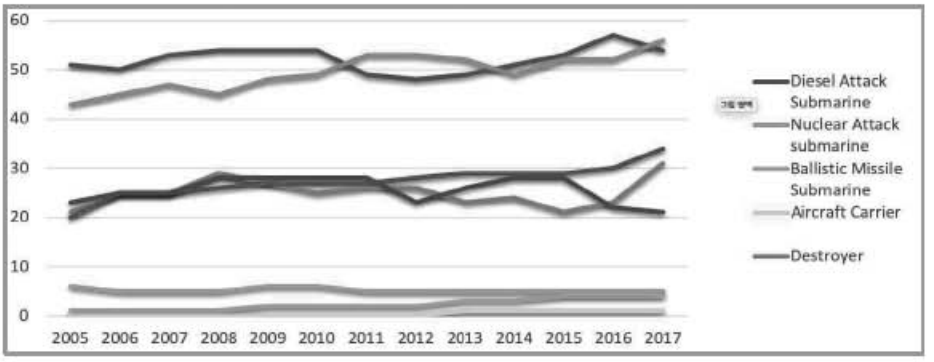
Source: Office of Naval Intelligence, 2017.

21) Office of Naval Intelligence, T*he PLA Navy: New Capabilities and Missions for 21st Century* (Washington D.C.:Office of Naval Intelligence, 2017), pp.11-12.

22) Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities -Background and Issues for Congress*, Congressional Research Service, August 1, 2018, p.3.

23) Nick Childs and Tom Waldwyn, "China's naval shipbuilding: delivering on its ambitionin a big way," International Institute for Strategic Studies, May 1, 2018.

Figure 2. Numbers of PLAN assets (2005-2017)



Source: U.S. Department of Defense.

Ⅲ. Development of the Republic of Korea Navy

1. Command and Control

The Republic of Korea Navy was a coastal navy specializing in counter-espionage operations in response to North Korea surface threats before Admiral An Byung-tae declared that "it is time for ROK Navy to ready to be the blue-water navy" in 1995. In response to An's declaration, President Kim Dae-Jung announced in a speech at the ROK Naval Academy commencement ceremony 2001 that ROK will "have a strategic mobile fleet that protects state's interests in the five big oceans and plays a role of keeping peace in the world."[24] On this basis, the ROKN pursued the way of being a "blue-water navy" for years and developed its naval power and doctrine to achieve this goal. To achieve its goal; being a blue-water navy, the ROKN will develop its Mobile Task Flotilla 7 into the task fleet by the mid-2020s and the task fleet will be a part of the "second operational command" that "handle potential and

24) "ROK Navy," Global Security, available at https://www.globalsecurity.org/military/ world /rok/navy.htm (accessed on February 20, 2019).

non-military threats," while the current ROK Fleet Command will be transformed into the "first operational command" which will command coastal operations against the North Korea threats.[25]

Control of the ROKN has been improving recently. All the warships mount a satellite antenna and controlled by the real-time satellite communication system. Tactical data link system not only among the ROK military but also between the ROK and US Navy is always properly working which increase joint and combined interoperability. Also, the ROKN can communicate with a naval ship deployed in the Gulf of Aden in which opposite side of the earth in the real time. When ROKN conducted the anti-piracy operation called "Dawn of Gulf of Aden" in 2011, the ROK JCS and Fleet Command (COMROKFLT) could command the operation through watching videos taken by Kai shot, a video camera attached on the special force unit's headgear.[26]

2. Capability and Capacity

Power projection capability is the weakest part of ROKN. In order to project power, platforms like aircraft carriers or amphibious ships are necessary. ROKS Dokdo, a Landing Platform Helicopter (LPH), is the only naval ship categorized as a quasi-aircraft carrier asset. Considering that the second ship of the Dokdo class, ROKS Marado, which will be commissioned in 2020, has the almost same feature as Dokdo, ROKN's power projection capability will not remarkably increase soon.

The growth of the ROKN's *undersea warfare* capability is impressive. Developing an indigenous 150 tons diesel submarine named Dolphin-class in the 1980s, the ROKN has built numerous diesel

25) "Navy pushes to create task fleet for blue-water operations,"Yonhap News, October 18, 2018.

26) Sung-woonYoo, "High-tech digital arms such as Kai shot, and smart bomb," Dong-A Ilbo, January 24, 2011, http://news.donga.com/3/all/20110124/34323886/1 (In Korean).

submarines. Chang Bogo- and Son Wonil-class submarines, originally German Type-209 and Type-214 submarines, were built in Korean shipyards licensed from the German HDW shipbuilding. ROKN's brand new indigenous 3,000 tons class diesel submarine, Dosan Anchang-ho, was launched in September 2018. This ship is evaluated as the ROKN submarine force's "leap forward" since its size and six vertical launch tubes which will be equipped with various types of missiles.[27] Submarine's weapon system is also moving forward; Son Wonil-class submarines are equipped with domestic-produced Haeseong-3 ASCM and Hyunmoo-3 land-attack cruise missiles,[28] and this growth in weapon systems allows the ROKN submarine forces to be called "national strategy units."

Surface combatants of the ROKN consist of diverse types of ships have made the ROKN's *Surface Warfare* capability secure. The ROKN operates not only high-tech warships such as Aegis destroyers but also small patrol boats less than 200 tons in order to counter North Korea's surface threats. Due to the constraints on the shipbuilding budget, older ROKN surface combatants only focused on anti-surface warfare (ASuW) so as to prevent North Korea surface assets' infiltration into the ROK. Those warships mounted ASCMs like RGM-84 Harpoon, but its sonar system was outdated. Whereas, new warships, commissioned after 2010 such as the Daegu-class frigate, have a high-tech combat system, are capable of land-attack and conducting simultaneous ASuW, AAW, and ASW.[29]

ROK also has been developing different types of missiles which can be carried on surface combatants. Haeseong-1, the ROKN's first

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27) "South Korea launches its first missile-capable submarine despite improved relations with North," *The Telegraph*, September 14, 2018.

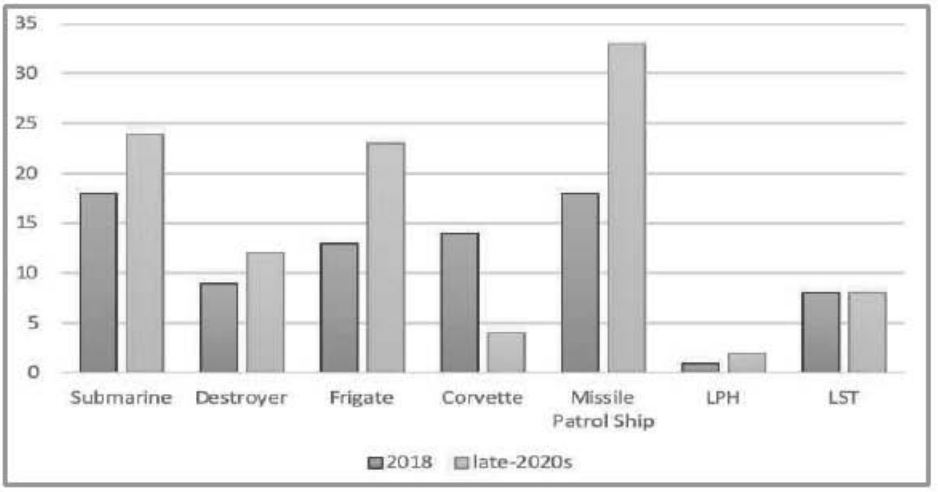
28) Missile Defense Project, "Missiles of South Korea," *Missile Threat*, Center for Strategic and International Studies, available at https://missilethreat.csis.org/country/ south-korea/ (accessed on March 5, 2019).

29) "FFX-II (Daegu Class) Multi-Role Frigates," *Naval Technology*, available athttps://www.naval -technology. com/projects/ffx-ii-daegu-class-multi-role-frigates/ (accessed on March 5, 2019).

indigenous ASCM, was operational in 2005, and it is able to be carried on board almost all ROKN warships. Haeseong-2 and Hyunmoo-3 are ROK domestic-produced land-attack missiles. Haeseong-2 was developed in two types; the slant-launched and the vertical-launched type, to be equipped on smaller warships which do not have a VLS.

The total number of the ROKN asset will decrease in terms of the total number since lots of small patrol boats will be decommissioned by the mid-2020s.[30] However, according to Figure 3, the number of newer, bigger, and higher-tech assets will increase in the late-2020s, and the ROKN's overall warfighting capability will be enhanced. The primary problem of the ROKN is not the number of assets but the number of human resources. Considering the aim of the government is to decrease the number of totals the ROK military personnel, it might be hard to operate all the assets properly if the number of personnel remain the same.

Figure 3. Number of ROK naval assets in 2018 and the late-2020s



Source: Data summed by the author. Collected from various sources such as ROK Defense White Paper, Global Fire Power, and the media.

30) "Total Naval Strength by Country," Global Fire Power, available at https:// www. globalfire power.com/navy-ships.asp (accessed on March 4, 2019).

Ⅳ. Recommendation for the ROKN: How can the ROKN respond to the PLAN?

1. Comparing the PLAN and the ROKN in numbers

Comparing two navies in numbers is a good way to understand the gap between them. Table 1 shows the comparison of the number of two navies' assets from 2005 to 2017. Total number of the ROKN in 2005 was 28.5% of the number of the PLAN assets, and it was 26.4% in 2017. The reason for increasing the quantitative gap between two navies is that the difference in the speed of asset replacement. China has launched approximately 678,000 tons of vessels since 2014, 2.5 times more than total tonnage of the ROKN vessels in 2017, 272,000 tons (See Figure 4).[31]

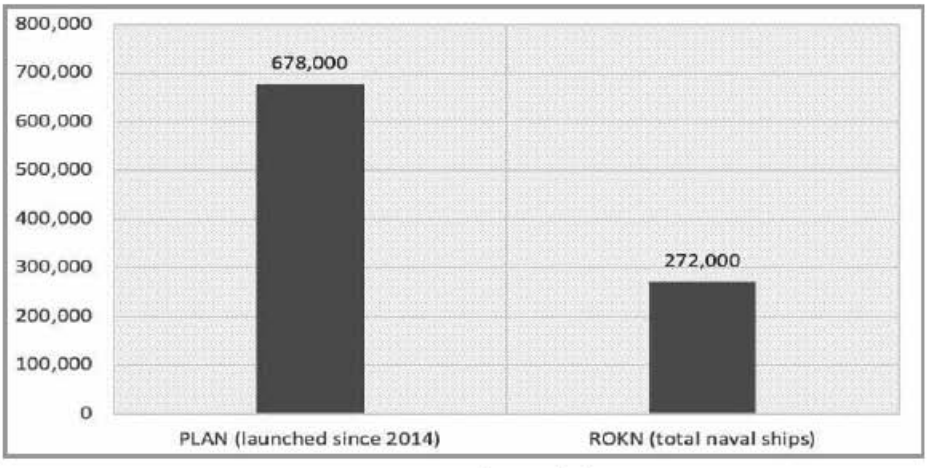
Table 1. Comparison of the number of the PLAN and ROKN in selected assets

	2005		2017		ROKN/PLAN (2005 → 2017, %)
	PLAN	ROKN	PLAN	ROKN	
Diesel Attack Submarine	51	9	54	18	17.6% → 33.3% (+15.7%)
Nuclear Attack submarine	6	0	5	0	0.0% (-)
Ballistic Missile Submarine	1	0	4	0	0.0% (-)
Aircraft Carrier	0	0	1	0	0.0% (-)
Destroyer	21	6	31	9	3.5% → 29.0% (+25.5%)
Frigate (+ Corvertte)	43	36	56	27	83.7% → 48.2% (-35.5%)
Missile Patrol Craft	51	0	88	18	0% → 20.5% (+20.5%)
Amphibious Ships	20	4	34	9	20% → 26.5% (+6.5%)
Total	193	55	273	72	28.5% → 26.4% (-2.1%)

Source: Global Fire Power and U.S. DoD.

31) Nick Childs and Tom Waldwyn, "China's."

Figure 4. Displacement of the PLAN vessels launched from 2014 and total of the ROKN

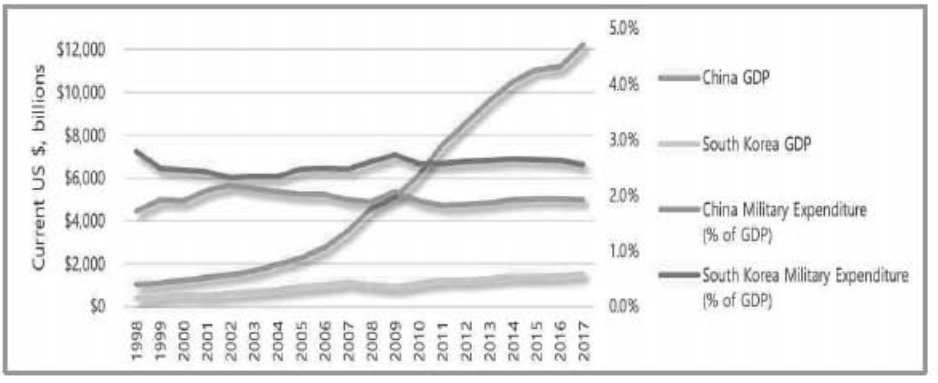


Source: Nick Childs andTom Waldwyn, "China's."

What we have to focus on is that China's military budget as a share of GDP in figure 5. It was around 2% of GDP for years and has not exceeded 2% since 2010. Meanwhile, South Korea's military budget has been between 2.5% and 2.7%, and the ROK put more economic effort on the military more than China. The size of the economy in terms of GDP has made a big difference between the two countries. It was small difference of GDP in 1998, but China's GDP has skyrocketed from the early-2000s. GDP in 2017 was $12,237 billion, 11.8 times more than 1998's. Considering China's military expenditure has increased 7.2 times between 1998 and 2017, China could have increased military expenditure higher than nowadays but has not increased. On the other hand, South Korea has increased the expenditure as much as it can endure.

It would be hardly possible for ROKN to overcome the PLAN regarding the numeric size, and the ROKN should face the PLAN with the small number of assets. Thus, the ROKN should develop the means that could ensure deterrence despite its relatively small size, and the paper will recommend two options based on the analysis.

Figure 5. Two Country's GDP (left) and military budget % of GDP (right)



Source: WorldBank Database: World Development Indicators.[32]

2. Recommendations

a. Developing asymmetric naval forces and enhancing defensive capabilities

By comparing the PLAN and the ROKN, it is evident that the ROKN would not catch up the PLAN in numbers. South Korea would not spend almost 15% of GDP on military expenditure to cope with China's military growth since it is not sustainable. Thus, the ROKN should find a way to develop its naval power selectively not only to respond to the growth of the PLAN more efficiently but also taking account of its military budget constraint.

The ROKN should focus on developing asymmetric naval assets and enhancing defensive capability to respond to the PLAN. First, the ROKN should build stronger submarine forces. An aircraft carrier, especially when it forms a strike group, it is hardly possible for surface combatants to attack or to threaten it. However, it is told that a single submarine can threaten a huge amount of naval surface warships

32) "Databank: World Development Indicators," World Bank, available at http:// databank.worldbank.org/data/source/world-development-indicators (accessed on March 7, 2019).

throughout history. During the Falkland war, for example British navy could not enjoy freedom of operation or navigation when the San Luis, an Argentina Type 209 submarine, was at sea. When the British navy recognized that an Argentina submarine was deployed by intercepting the San Luis' radio communication, it assigned ASW mission to more than 10 destroyers and frigates. Moreover, British navy finally failed to detect San Luis even San Luis conducted three times torpedo attacks to HMS Brilliant, Yarmouth, and Arrow respectively.[33]

Second, the ROKN should enhance its defensive capability such as AAW or ASW capabilities. Since the ROKN's primary mission was "coastal/littoral defense" against North Korea threats composed of small and fast surface assets, the ROKN's AAW and ASW capabilities have been weak. The critical case of the ROKN's weakness in ASW capability is the sinking of ROKS Cheonan in 2010, and this case revealed that Pohang-class corvettes cannot detect an incoming torpedo.

In order to deal with the PLAN's naval assets composed of an aircraft carrier group and submarine forces, it is crucial to defend attacks from air (ship-borne aircraft and missiles) and underwater, and to conduct counterattacks by strong submarine forces.

b. Enhancing maritime cooperation with relevant countries

Other than the ROK-US alliance, the ROKN should coordinate with friendly navies in Asia-Pacific region. Since South Korea is relying on its 99.7% of trade via sea routes including 100% of crude oil,[34] the stability of the SCS and the ECS is essential. If any crisis in those regions would escalate, economy and welfare of South Korea would be affected seriously since a huge portion of South Korea's trade would be blocked. In this regard, South Korea cannot ignore maritime conflicts

33) Sebastien Roblin, "How the Falklands War (Thanks to a Stealthy Submarine) Could Have Gone Very Differently," The National Interest, November 27, 2016.

34) McDevitt, "The Maritime," p.30.

in SCS and ECS although those regions are far from South Korea geographically. South Korea should involve actively in multilateral defense institutions such as ASEAN Defense Ministers Meeting+3 (ADMM+3) and Western Pacific Naval Symposium (WPNS) to pursue the stability of the SCS and ECS. By putting efforts on confidence building among the relevant countries, the level of conflicts in the region would decrease.

Also, the trilateral alliance among ROK-U.S.-Japan would be considered even though the ROK-U.S.-Japan alliance will not be implemented in the near future due to historical problems. However, this alliance would raise a perspective that China is the existence enemy against the trilateral alliance, and it could increase the conflict in the region paradoxically.

It is more critical to prevent any maritime conflict through confidence building between navies in the region rather than confronting each other. In this perspective, agreement on Code for Unplanned Encounters at Sea (CUES) in 2014 was a valuable outcome of the WPNS, drawing international naval cooperation under the participation of the PLAN in the Western Pacific region. It is evident that China does not want any war as well and the ROKN should find a way to resolve a conflict with the PLAN peacefully based on international cooperation rather than response via military power.

Ⅴ. Conclusion

China is the most rapidly progressing state in the world regarding achieving military modernization in terms of capability and capacity. Thanks to its high economic growth, China has enough budget to invest in the military although maintaining total military expenditures close to previously declared GDP percentages. The military expenditure of

China increased 7.2 times from 1998 to 2017, but it was still under 2% of the GDP of China. The PLAN launched 678,000 tons of naval vessels from 2014 to 2017, three times more than the total tonnage of ROKN assets. Consequently, numbers of ROKN assets are only 26.4% of those of PLAN assets, and it seems hardly possible that the ROKN can catch-up to the PLAN in numbers of assets.

This paper illustrates that it is hard for the ROKN to respond to the PLAN militarily by analyzing command, control, capability, and capacity of the two navies. The ROKN should focus on building asymmetric assets such as submarine forces in order to deal with the PLAN's large capacity. The development of confidence building among navies in the Western Pacific region would be effective means to respond to China's naval modernization. China has undergone maritime conflicts in the SCS and ECS with many states and experienced some collisions between them. However, there are also many efforts to relieve conflicts in the region as well. The WPNS and the ADMM+3 are representative meetings between military leaders in the region. The ROKN should use these meetings effectively in order to respond to the PLAN's growth.

The ROKN is accessed to be the 10th ranked navy in the world in terms of fighting power. However, South Korea is surrounded by the world's most powerful navies, and that rank may not translate to effective maritime defense. China's naval modernization is one the most significant concerns for the ROKN. Thus, the ROKN should develop an effective strategy and support that strategy with an effective building plan. Additionally, the ROKN must enhance military cooperation with relevant states in the region to mitigate the PLAN's advantages.

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요 약

중국 해군 현대화에 대한 한국 해군의 대응 방안 : 지휘, 통제, 능력, 수량 분석을 중심으로

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중국 해군의 성장은 동아시아의 안보환경 변화에 지대한 영향을 미치고 있으며, 한국 해군 또한 그 영향에서 벗어날 수 없는 실정이다. 대한민국은 중국과 지리적으로 맞닿아 있으며, 현재 불법 중국어선 및 이어도 문제 등 중국과의 수많은 해양갈등을 겪고 있는 상황으로, 이에 대한 적절한 대응을 위해서 한국 해군은 중국 해군의 현대화에 대한 대응을 준비해야만 한다.

본고는 중국과 한국의 해군력을 로버트 토마스 전 미 해군 중장이 제시한 지휘, 통제, 능력, 수량의 네 가지 측면에서 분석 및 비교하였다. 중국 해군은 적의 접근을 원해에서부터 차단하는 것을 목표로 하고(지휘), 그에 걸맞게 C4I 능력을 확충해나가고 있으며(통제), 전력투사, 수중/수상전, 해상재보급 역량을 늘려가고(능력), 최근 4년간 세계 대다수 해군의 총 톤수를 능가하는 수준의 함정건조 추세를 보이고 있다(수량). 한국 해군은 90년대 이후 "대양해군"을 목표로 해왔으며(지휘) 아덴만까지 실시간으로 통제 가능한 뛰어난 C4I 능력을 갖추었으나(통제), 아직 대양해군에 걸맞는 능력 및 전력을 구비하였다고 보기는 어렵다.

한국 해군이 상기 네 가지 측면에서 중국 해군을 따라잡는 것은 거의 불가능에 가깝다. 중국은 GDP의 2% 이내에서 국방비를 책정함에도 매년 GDP의 2.7%를 국방비에 투자하는 한국 국방비의 6배를 상회하며, 이 격차는 계속 커져가는 추세이다. 따라서, 대한민국 해군은 첫째, 잠수함 등 비대칭 전력 확보에 주력하고 방공/대잠능력 등 방어력을 향상시켜야 하며, 둘째, 관련국과의 긴밀한 협력을 통해 동아시아 및 서태평양 지역에서의 해양안보 안정화를 위

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해 노력해야한다. ADMM+3 등 다자 안보의 틀 안에서 역내 해양의 안정을 꾀할 수 있도록 한국 해군은 정책적 노력을 경주해야할 것이다.

핵심어 : 중국 해군, 한국 해군, 해군력, 동아시아 및 서태평양 해양 안보

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