Indonesian Journal of International Law

Volume 16
Number 1 *Culture & International Law*

Article 3

10-31-2018

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Indonesian Journal of International Law (2018), Vol. 16 No. 1, pp. 61 - 83
http://dx.doi.org/10.17304/ijil.vol16.1.770

MILITARY APPLICATION OF UNMANNED UNDERWATER VEHICLES: IN QUEST OF A NEW LEGAL REGIME?

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Abstract

The Unmanned Underwater Vehicles (UUV) is commonly used for current military operations. There are three legal issues arising out of it, namely (i) legal status; (ii) immunity; and (iii) configuration and rule of the road. The international community has also witnessed the impact of the unregulated UUVs military operation. The article will examined these legal issues in the perspective of international and national law and States practice. To enrich the discussion, legal scholars and practitioners views on UUV will be included. The capability of UUV will also be discussed to increase the comprehension of its role in military operations. Based on existing regulations, either in the international or national law, UUV is not expressly regulated. Furthermore, numerous State react to and/or conduct military application of UUV differently. Hence, it can be suggested that in preventing more incidents, UUVs need to be regulated, either in new regulations or amendment to existing regulation. If it is not possible, states can be urged by the international community and other relevant stakeholders to adopt best standard or practice in their national regulation.

Keywords: *unmanned underwater vehicles, military operation, legal status, regulation, legal issues.*

Submitted : 5 March 2018 | Revised : 21 August 2018 | Accepted : 3 October 2018

I. INTRODUCTION

Military application of Unmanned Underwater Vehicles (UUV) in foreign maritime zones is an emerging issues in the law of the sea, which needs to be addressed immediately and comprehensively. There is no existing legal framework regulating this technology,[1] yet UUV has been used by a number of States for variety military purposes, such as surveillance, transportation, espionage, mine clearance, assault devices[2]. Furthermore, based on a market analysis, the world will witness a large increase in UUV application since its global market was

[1] Stephanie Showalter, "The Legal Status of Autonomous Underwater Vehicles," The Marine Technology Society Journal, vol. 38, 2004.

[2] Eric Van Hooydonk, "The Law of unmanned merchant shipping – an exploration", The Journal of International Maritime Law, vol. 20, 2014.

projected to grow from USD 2.29 Billion in 2015 to USD 4.00 Billion in 2020.[3] On the other hand, as seen in the recent UUV's case in the South China Sea, the ambiguity of UUV might lead to legal or political related incidents. Hence, the international community strongly need to discuss the contemporary phenomenon of UUV in order to identify and further solve the issues.

The issue of military operation is not expressly and comprehensively dealt in the Law of the Sea Convention (LOSC). However, there are some restrictions on military activities in waters under national jurisdiction of Coastal States.[4] Compared to these maritime zones, --namely territorial waters, archipelagic waters, and straits-- military operations in Exclusive Economic Zone (EEZ) are undoubtedly more complicated or complex from the legal perspective. Unlike these areas, military activities in the EEZ is full of ambiguity,[5] or simply put, it is an unresolved issue and matter of contention within the international law of the sea. International community is currently divided into two views when it is comes to military activities in the EEZ issue. First, Coastal States that purport to limit and/or prohibit foreign military activities in their EEZ due to the impact of these activities to their national security. Second, foreign military activities in EEZ cannot be restricted or limited by Coastal States.[6] Those different perspective had resulted in many international incidents at sea, mainly involving United States of America (USA) and China.[7]

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[3] Marketsandmarkets.com, "Unmanned Underwater Vehicles (UUV) Market by Type (Remotely Operated Vehicle & Autonomous Underwater Vehicle), ROV & AUV Market by Application, by Product, by Propulsion System, by Payload & by Geography - Global Forecasts to 2020", available at: http://www.marketsandmarkets.com/Market-Reports/unmanned-underwater-vehicles-market-140710720.html, accessed on 16 June 2017.

[4] Convention on the Law of the Sea, opened for signature 10 December 1982, 1833 *UNTS* 3 (entered into force 16 November 1994), Article 19, 39, 40, 52, and 54.

[5] George Galdorisi and Alan Kaufman, "Military Activities in the Exclusive Economic Zone: Preventing Uncertainty and Defusing Conflict", California Western International Law Journal, vol. 32, 2003.

[6] Silvia Menegazzi, "Military Exercises in the Exclusive Economic Zone: The Chinese Perspective", Maritime Safety and Security Law Journal, vol. 1, 2015.

[7] There are 11 incidents at sea between United States and China arising out of military activities in the EEZ issue noted by the author.

Conventional military activities at sea are commonly conducted by States by deploying their warship and government vessels for non-commercial purposes, as well as submarines. All of these vehicles are regulated differently in the Law of the Sea Convention. While Government vessels operated for non-economic purposes and submarines are left undefined in the LOSC, warship is well-defined and regulated clearly in the LOSC.[8] Submarine interestingly is not classified as warship since the Article 30 LOSC is intended to regulate all underwater vessels operating underwater.[9] Aside from definition, the Convention also stipulates the characteristics or nature of these vehicles. In regards with government vessels, we need to firstly examine the concept of vessels or ships in LOSC, for the distinctive nature of government vessel is only their complete sovereign immunity and right to conduct law enforcement as long as they are clearly identified.[10] On the other side, less attention was given to submarine by the LOSC since they are only stipulated to navigate on the surface.[11] In general, although warships, submarines, and Government vessels operated for non-economic purposes are all entitled to immunity and navigational rights in foreign maritime zones, these rights do not exempt them from some obligations relating to maritime security and safety. Furthermore, based on existing regulations that shall be further elaborated, the LOSC and other maritime related conventions were also enacted in the context of manned vessels or vehicles. For this reason, questions on the application of unmanned underwater vehicles are highly relevant to the current international community.[12]

As previously happened to the military activities in EEZ, legal vacuum and uncertainties are likely to cause international problems or incidents in the future. Questions regarding legal certainty of military UUVs are now increasingly significant due to the recent incident involving USA and China in South China Sea. On 15 December 2016, a United States Unmanned Underwater Vehicles (UUV) --Slocum

8 See note 5, Article 29, 107, 110 and 111.

9 Kresno Buntoro, Lintas Navigasi di Nusantara Indonesia, PT RajaGrafindo Persada Jakarta, 2014.

10 *Ibid*, Article 32.

11 *Ibid,* Article 20.

12 Craig H. Allen, "The Seabots are Coming Here: Should they be treated as 'Vessels'?" The Journal of Navigation*,* vol. 65, 2012.

Gliders--, was taken from the water's surface by a Chinese warship, PRC DALANG III-Class (ASR-510). The seizure was conducted just in front of USNS Bowditch, a US Navy vessel which tried to take the UUVs at that moment. USNS Bowditch crews reportedly were immediately contacting the Chinese warship through bridge to bridge radio.[13] Jeff Davis, a representative from Pentagon, claimed that the Chinese warship responded to this radio call and communication was generated promptly between those ships. However, the Chinese warship did not respond to US warship's demand of returning the UUVs back and decided to leave the location immediately.[14] Bilateral relation between USA and China was deteriorated for six (6) days and there was a battle of arguments between legal experts and representatives from both countries, primarily on the legal status and immunity of UUV. US officials and some experts argued that UUV can be classified as Government watercraft or vessels, thus it entitled to sovereign immunity.[15] On the other side, some argued it cannot be classified as government vessels or even warship.[16] The China government itself chose to avoid these contentions and decided to claim that the UUV was unidentified.[17]

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[13] Lucas Tomlinson, "China Stole US underwater drone in South China Sea as Americans watched", available at: http://www.foxnews.com/world/2016/12/16/china-steals-us-underwater-drone-in-south-china-sea.html, accessed on 17 June 2017.

[14] Terri Moon Cronk, "Chinese Seize U.S. Navy Underwater Drone in South China Sea", available at: https://www.defense.gov/News/Article/Article/1032823/chinese-seize-us-navy-underwater-drone-in-south-china-sea/, accessed on 17 June 2017.

[15] See *Ibid*; James Kraska and Raul Pedrozo, "China's Capture of U.S. Underwater Drone Violates Law of the Sea", available at: https://www.lawfareblog.com/chinas-capture-us-underwater-drone-violates-law-sea, accessed on 17 June 2017; Julian Ku, "The Nonexistent Legal Basis for China's Seizure of the U.S. Navy's Drone in the South China Sea", available at: https://lawfareblog.com/nonexistent-legal-basis-chinas-seizure-us-navys-drone-south-china-sea, accessed on 17 June 2017; Emily Tamkin dan Paul Mcleary, "China Seizes U.S. Navy Drone in South China Sea", available at: http://foreignpolicy.com/2016/12/16/china-seizes-u-s-navy-drone-in-in-south-china-sea-raising-stakes-president-trump/, accessed on 17 June 2017.

[16] Yan Yan, "The US Underwater Drone is not Entitled to Sovereign Immunity", available at: http://ippreview.com/index.php/Home/Blog/single/id/315.html, accessed on 17 June 2017.

[17] Xinhua, "China to hand over underwater drone to U.S. in appropriate manner", available at: http://news.xinhuanet.com/english/2016-12/18/c_135913344.htm, accessed on 17 June 2017.

The article is intended to examine and analyze the legal status of Unmanned Underwater Vehicles and its implication in the perspective of international law, national law, and State practices. While the UUVs is commonly deployed in contemporary military activities at sea, this technology has not regulated or clearly regulated in the existing legal frameworks. At the same time, technology development had enabled the UUVs to execute numerous missions which were previously assigned to conventional vessels or manned technology. In order to prevent similar misunderstanding among States which will result in international incidents, UUVs deployed in the military operation has to be expressly and comprehensively regulated in the legal frameworks, both on national and international scale.

This article will be divided into four (4) parts of discussion, namely introduction, development of UUVs in military sector, legal vacuum on military application of UUVs, various states practice on military UUV, and conclusion. The main argument, as stated in the introduction, will be supported by the second, third, and fourth part of this article. In the second part, nature of underwater activities and current capabilities of UUV in military sector will be elaborated to indicate the future needs of military operations. Furthermore, discussions on military UUVs legal status and its legal implication will signify all potential problems of the UUVs military application. To enrich the discussion, the importance of legal clarity in this military trend from practical aspect will also be taken into account.

II. CONTINOUS AND PROSPECTIVE DEVELOPMENT OF UNMANNED UNDERWATER VEHICLES IN MILITARY SECTOR

Nowadays, military activities at sea is not only associated with the activities or operation on the surface, but also in other dimensions of sea. It should be noted that since 20th century, naval forces had been operated in three dimensions, namely on the surface, under, and above the waters.[18] In practice, these domains have their own characteristics which need to be managed differently by naval forces. However,

[18] Ian Speller, Understanding Naval Warfare, Routledge Abingdon, 2014.

unlike surface and above the sea dimension, underwater dimension has some additional unique characteristics. In this part, the discussion will be focused on the nature and characteristics of underwater domain. Through an in-depth understanding of underwater domain, we will be able to comprehend the potentials or capabilities of UUV in the military operation, as well as its impact on rights and interests of other States in the maritime areas.

Underwater domain is quite different from surface and above the waters dimension. In the two latter dimensions, an object normally can be seen, located, and identified. Furthermore, any movement of the platforms or objects will not be awfully hampered or impeded by medium. Meanwhile, there are physical challenges, namely radiation, sound, sights and signals in the undersea environment.[19] To sum up these differences, Borchert, Mahon, and Kraemer divide them into three main aspects, namely physicals (such as salinity of water, water temperature, water currents, multi-path reflection from the seabed and the surface), regulatory, and cultural aspects. In regulatory aspects, the difference can be seen as there is no undersea traffic management as in the surface or sky domain. Moreover, the cultural aspect can be perceived as command and order paradigm, which is also different when it comes to practice.[20] Thus, naval forces had to meet and overcome these different challenges, as well as obstacles in operating under the waters.

These unique characteristics of underwater domain can be perceived as problems and also at the same time, as prospects for some States. This domain is indeed a high cost and high risk environment, thereby as argued by Colonel Kresno Buntoro, only States with certain degree of capabilities and technologies that capable to operate or navigate and take control in the underwater. Reflecting from the introduction and early stages of military application of submarine in the First and Second World War, underwater domain held a vital role in shaping and determining the maritime situation and control in general.[21] Submarines

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[19] Naval Studies Board and National Research Council, An Assessment of Undersea Weapons Science and Technology, National Academy Press Washington, 2000.

[20] Heiko Borchert, Tim Kraemer, and Daniel Mahon, "Waiting for Disruption?! Undersea Autonomy and the Challenging Nature of Naval Innovation", RSIS Working Paper, No. 302, 2017.

[21] James P. Delgado, Silent Killers: Submarine and Underwater Warfare, Osprey

was also the key factor in Cold War since they posed imminent and continuous threat to Soviets till its breakdown.[22] Based on these previous times, submarines application in military operations resulted in asymmetric warfare. Due to the danger it posed, the submarine was regulated in some maritime treaties in the times of armed conflict[23] and peace. Regulations of submarine in peacetime can be seen in LOSC, Convention on the International Regulations for Preventing Collisions at Sea (COLREGs 1972), Code for Unplanned Encounters at Sea (CUES), and other bilateral or regional treaties.

Underwater technology has been continuously evolving from manned technology, as seen in submarine and other submerged vehicles, to unmanned technology, especially in military sector. In the earliest time of Unmanned Underwater Vehicles, it comprised of Autonomous Underwater Vehicles (AUV) and Remotely Operated Vehicles (ROV)[24] and assigned to execute their first military missions, namely Intelligence, Surveillance, and Reconnaissance (ISR); Mine Counter Measure (MCM); and Anti-Submarine Warfare (ASW)[25]. However, along with the significant development of technology in the 21st century, UUVs have been assigned with nine military missions as stipulated in the US NAVY UUV Master Plan and NATO's. Those missions are ISR, MCM, ASW, Inspection/Identification, Oceanography, Communication / Navigation Network Nodes (CN3), Payload Delivery, Information Operations (IO), Time Critical Strike (TCS), Border Patrol (which executed by Homeland Defense, Anti-Terrorism / Force Protection in the USA) and Sea-Base Support.[26] These assigned missions prove that

Publishing Oxford, 2011; Daniel E. Benere, "A Critical Examination of the U.S. Navy's Use of Unrestricted Submarine Warfare in the Pacific Theatre during World War II", Naval War College, 1992.

22 Jim Christley, US Nuclear Submarines: The Fast Attack, Osphrey Publishing Oxford, 2007.

23 W. Hays Parks, "Making Law of War Treaties: Lessons from Submarine Warfare Regulation", International Law Studies, vol. 75, 2000.

24 This article adopts United States perspective in classifying the Unmanned Underwater Vehicles. Based on its degree of autonomy, Unmanned Underwater Vehicles is divided into Remotely Operated Vehicles and Autonomous Underwater Vehicles.

25 Massimo Annati, "UUVs and AUVs Come of Age", Military Technology, vol. 29, 2005.

26 Department of the Navy, The Navy Unmanned Undersea Vehicles Master Plan, Department of the Navy, 2004; Combined Joint Operations from the Sea Centre of

the UUVs are capable or at least, are going to be completely capable to execute all conventional missions previously assigned to submarines and other manned submerged vessels. In addition, compared to conventional submarines and other manned vessels, UUVs operation in the underwater environment is less risky and money.

Aside from the conventional maritime powers, such as the USA and UK, many states have owned and utilized the UUVs for military uses. For instance, Chinese People's Liberation Army Navy (PLAN) was reportedly developing their own UUVs, as an addition to some latest UUVs invention from universities and research centers. However, it is a matter of confidentiality to identify capabilities and uses of the PLAN's UUVs –Zhizui--.[27] Norway naval forces has also showed a deep interest in these technology application since the year of 2001. As a matter of fact, Norway is currently procuring four more additional UUVs, --HUGIN AUV-- which are capable to operate in the depth of 3000 meters and equipped with sensors for modern military mine hunting.[28] As a new emerging power in the Asia Pacific, India has designed and constructed some UUVs for the last few years. In 2016, a prototype was successfully made and designed to be deployed in military operation at sea. Latest discourse of UUVs development in India is integrated operation between UUVs and submarines for the purposes of surveillance.[29] Based on interviews that were conducted to Brigadier General Jan Pieter Ate and Col. Kresno Buntoro, Indonesia is far behind from these States, both on the UUVs issue and underwater domain in general. However, Ate claimed that Department of Defense, along with its defense industry have successfully built a UUVs capable

Excellence, Guidance for Developing Maritime Unmanned Systems (MUS) Capability, Combined Joint Operations from the Sea Centre of Excellence, 2012.

[27] DGI Center for Intelligence Research and Analysis, China's Industrial and Military Robotics Development, Center for Intelligence Research and Analysis Vienna, 2016.

[28] Per Espen Hagen, *et al.*, "Military Operations with HUGIN AUVs: Lessons learned and the Way ahead", Oceans, vol. 2, 2005; Kongsberg Maritime, "The Norwegian Armed Forces Procures HUGIN Autonomous Underwater Vehicles for NOK 155 million", available at: https://www.km.kongsberg.com/ks/web/nokbg0238.nsf/AllWeb/3B49DDAA3ACF6413C12580F0003DD10C?OpenDocument, accessed on 18 June 2017.

[29] Abhijit Singh, "Unmanned & Autonomous Vehicles and Future Maritime Operations in Littoral Asia", ORF Special Report, July 2016.

of 150 meters depth. On the other side, *TNI Angkatan Laut* (Indonesian Navy) are still developing technical standard operating procedure (SOP) for UUVs operation.

To conclude the discussion on global development of UUVs, taking account of the amount of States owning and utilizing this technology, low-cost and easy access to market are the strong advantages of this technology. In addition, contrasting to the former condition, UUV's uses trend also enables non-state actors, including terrorist groups to easily take a part in underwater arena. Accordingly, in order to ensure the UUVs military application will not hamper and disrupt safety navigation, peaceful uses of the sea, as well as other legitimate rights and interest of all State in maritime zones, legal certainty and clarity is urgently needed, either on international or at least, national scale.

III. LEGAL VACUUM ON MILITARY APPLICATION OF UNMANNED UNDERWATER VEHICLES

As previously stated in the introduction, a discussion on legal status of UUVs and its legal implication will also be conducted to examine and ensure whether or not the technology is capable to comply with the existing rules and regulations. It also arises further question, which is to some extent this UUVs can comply with those regulations. Hence, legal status of UUVs deployed in military operation will be fundamental in determining specific matters pertaining its operation, such as navigational rights, immunity, important maritime functions, whether it is subject to international legal regimes, and belligerent rights.[30]

A. INTERNATIONAL LAW

There are only three (3) instruments in international law that will be discussed in this occasion, namely the LOSC, COLREGs, and CUES. Aside from the status of LOSC as the main convention for the law of the sea, specific regulations on military operations at sea in times of peace, which are stipulated in the LOSC, COLREGs, and CUES is the underlying reason of the selection. In addition, COLREGs was

[30] Andrew Norris, "Legal Issues Relating to Unmanned Maritime System Monograph", US Naval War College, 2013.

primarily designed to maintain vessel safety by providing all vessels rule of the road. Despite its non-binding status, CUES held the similar role in the case of military vessels. However, since the UUVs have not specifically mentioned or regulated in these instruments, an analysis will be used to compare UUVs to objects that are clearly regulated in the existing regulations, namely vessels, warship, submarines, and government vessels for non-economic purposes.

Unlike COLREGs and CUES, the LOSC regulates legal status and/or characteristics of all aforementioned objects. However, the COLREGs successfully fill the vacuum left by LOSC regarding vessels concept or definition. A question on whether UUVs can be classified as vessels or ships[31] in the LOSC will be raised to begin this discussion. In the LOSC, vessels or ships are not defined clearly or specifically. Walker further argued that the International Law Commission's (ILC) decision not to put a rigid meaning to vessels or ships is absolutely right. It signified the understanding that there is no uniform meaning or concept of those objects among States. However, based on his perspective, vessels definition from American Branch International Law Association Law of the Sea (ABILA LOS) Committee can be taken into account for the sake of national regulation. They defined ships as "human-made device, including a submersible vessel, capable of traversing the sea".[32] Hence, referring to this definition, UUVs can be classified as vessels since it is a human-made device and capable of traversing the sea.

On the other side, COLREGs defines vessels or ships differently. Under this convention, ships are defined as 'every description of water craft, including non-displacement craft, WIG craft and seaplanes, used or capable of being used as a means of transportation on water'.[33] The phrase of "a means of transportation on water" is quite confusing since some UUVs are designed to transport something, for example payload

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[31] Terms of vessels and ships have similar meaning, yet used interchangeably in the Law of the Sea Convention. See George K. Walker, *et al.,* Definitions for the Law of the Sea: Terms Not Defined by the 1982 Convention, Martinus Nijhoff Publishers Leiden, 2012.

[32] *Ibid.*

[33] Convention on the International Regulations for Preventing Collisions at Sea, opened for signature 20 October 1972, 1050 *UNTS* 16 (entered into force 15 July 1977).

or weapons systems, yet some are not. It thus resulted in ambiguous situation and have to be examined *per se*.[34]This task would be easy in the case of transparent UUVs operation, for instance the ones that were operated by the US Navy, but not for the operations that were intended to be classified by some States. However, should the UUVs are also classified as vessels in COLREGs and LOSC, questions regarding technical matters will be arising, such as proper lookout, bridge to bridge call, communication delay, underwater environment impact, and different lighting scheme.[35]

Although the LOSC did not give any definition on vessels or ships, this definition can be seen or comprehended in the whole context of vessel's regulation under the LOSC. For instance, in the Article 94 LOSC, it can be concluded that all vessels, in regards with flag State obligations, need to be manned or crewed. Furthermore, the LOSC also emphasized the safety of navigation purposes on this manned or crewed provision. Hence, provisions stipulated in Article 94 para (4) (b) and (c) are used as the main basis of a vessels concept alternative. According to these provisions, flag States must ensure that:

> *"Each ship is in the charge of a master and officers who possess appropriate qualifications, in particular in seamanship, navigation, communications and marine engineering, and that the crew is appropriate in qualification and numbers for the type, size, machinery and equipment of the ship."* Article 94 para (4) (b)

> *"the master, officers and, to the extent appropriate, the crew are fully conversant with and required to observe the applicable international regulations concerning the safety of life at sea, the prevention of collisions, the prevention, reduction and control of marine pollution, and the maintenance of communications by radio."* Article 94 para (4) (c)

As previously mentioned, regardless of the legal status, it is still unclear whether this unmanned maritime system can be operated in accordance with the conventional mechanism or rules, considering the nature of operation pertaining to this technology. Thus, next discussion is on whether UUVs deployed in military operation can be classified as

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[34] Andrew H. Henderson, "Murky Waters: The Legal Status of Unmanned Undersea Vehicles", Naval Law Review, vol. 55, 2006.

[35] George Detweiler dan Rand D. Le Bouvier, "The Age of Unmanned Shipping", U.S Coast Guard Proceedings, 2015.

Government vessels operated for non-commercial purposes. Similar to regular vessels, government vessel also goes undefined in the LOSC. However, it should be noted that this vessel need to be clearly marked and engaged in other purposes than commercial ones. Reflecting from the recent incident between USA and China in South China Sea, identification or marking of the UUV held a pivotal role in distinguishing government vessels from other vessels. The government of China stated that it was unidentified, while at the same time, US government did not publish any actual picture of that UUV. Thus, it can be argued that marking or identification alone is an issue that needs to be taken into account in operating all government vessels. Regulations on specific marking or identification matter are indeed unregulated under the LOSC and COLREGs. However, the LOSC laid a general principle for the government vessels, which is their rights of sovereign immunity. In according with this context, some legal experts and practitioners argued that all military UUVs can be classified as Government vessels operated for non-commercial purposes.[36] However, it arises further questions on whether the UUVs will have the right of visit and hot pursuit as well. Should the UUVs are granted with these rights, to what extent this technology can undertake them in accordance with the principles and rules laid out in existing maritime related conventions? This part is still also left untold by legal experts and practitioners discussing the UUV issue.

Next discussion is whether the military UUV can be classified as warship in the LOSC. In the Article 29 of LOSC, warship is clearly defined as:

> *"a ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the State and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline."*

Due to the explicit and obvious manned characteristics, some

[36] Robert McLaughlin, "Unmanned Naval Vehicles and the Law of Naval Warfare", in New Technologies and the Law of Armed Conflict, ed. Hitoshi Nahu dan Robert Mclaughlin, T.M.C. Asser Press The Hague, 2014; James Kraska, "The Law of Unmanned Naval Systems in War and Peace", Journal of Ocean Technology, vol. 5, 2010.

argued that UUVs surely cannot be classified as warship.[37] So far, there is no crew or commanding officer on board existing UUVs since these objects are automatically operated or remotely controlled by authorized officers. Furthermore, all international standard certifications for the onboard officers are different from the possessed certifications of controlling officers. However, some argued the paradigm of Unmanned Aerial Vehicles (UAV) or so-called drone classification as military planes can be adopted to the UUVs case. They further argued that the commanding officers did not necessarily need to be within the drone. In addition, its programmers or remote controllers who are listed under regular armed forces discipline are adequate to fulfill this obligation. Hence, as applied in the drone case, it is undoubtedly logical to regard all military UUVs as warships.[38]

Similar to Government vessels operated for non-commercial purposes, warships are also entitled to complete sovereign immunity. For this reason, warships have some enforcement jurisdiction, as mainly stipulated in the chapter of high seas in the LOSC. As previously mentioned in the government vessels case, same question is arising out of this warship status, which is to what extent is the UUVs entitled to and how UUVs will be marked? Simply put, marking or identification issue is complex because all specifications and details on them fall within national jurisdiction of all States, regardless of the common practice in the warship or coast guard vessels, as they were established through a long tradition. Hence, in order to establish a common practice related to identification mark of UUVs, the international community strongly need to discuss and agree on that matter.

Discussions on whether military UUVs can be classified as submarines is less relevant since the military submarine itself is classified as warship. However, specific rule is tailored to submarines in territorial sea, where they will enjoy innocent passage by navigating on the surface. Apart from that provision, submarine is not much discussed

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37 James Kraska, see note 16; Mark. J Valencia, "The US-China Underwater Drone Incident: Parsing the Legal Incident", available at: http://www.ippreview.com/index.php/Home/Blog/single/id/325.html, accessed on 18 June 2017; Daniel Vallejo, "Electric Currents: Programming Legal Status into Autonomous Unmanned Maritime Vehicles", Case Western Reserve Journal of International Law, vol. 47, 2015.

38 Andrew Norris, See Note 31.

in the LOSC. However, the COLREGs provides some specification and rules of the road of submarine operating on the surface. In this matter, UUVs can be arguably configured and treated like submarines, yet the UUVs need to be adapted to the warship classification. Unless there has been certainty on the legal status of military UUVs, it would be useless to configure the UUVs in accordance with the COLREGs.

Since the LOSC and COLREGs did not provide adequate answers or clarifications on the legal status and regulation of UUVs deployed in military operations, the CUES automatically will not provide substantial solution as well. This instrument, which was originally designed to mitigate and prevent further incidents and conflicts from the unplanned encounters at sea between States naval forces perceiving the military activities at sea differently, adopts the same definition of objects that were stipulated in the COLREGs. Hence, in line with the ambiguity of UUVs in the perspective of COLREGs, UUVs were not fully accommodated or clearly regulated under the CUES. However, considering its status as a non-binding instrument, CUES will be more easily amended or altered according to the change in military technological development. In addition, it can be argued that the flexibility of CUES are supported by the fact that naval diplomacy in the CUES is not as significant as state diplomacy. Hence, responding to this situation, Yan recommends an additional appendix specifically regulating the UUVs.[39]

B. NATIONAL REGULATION

Compared to other States, USA is the first State to introduce and enact national regulation on military application of UUVs. The government of USA has not just enacted regulation concerning legal issues, but also technical issues. However, it should be noted that since the article is intended to focus on the legal discussion, technical issues are not taken into account. In accordance with the US Commander Handbook, UUVs deployed in military operations are classified as State watercrafts or vessels, and thereby are entitled to complete sovereign immunity.[40]

[39] Kristin Huang, "China and US 'need rules' for underwater drone clashes", available at: http://www.scmp.com/news/china/diplomacy-defence/article/2058186/china-and-us-need-rules-underwater-drone-clashes, accessed on 18 June 2017.

[40] U.S. Navy, U.S. Marine Corps, and U.S. Coast Guard, The Commander's Handbook on the Law of Naval Operations, [s.l.: s.n]., 2007, pp. 2.2.5.

Moreover, the US Government has also enacted an integrated operation and development plan concerning the unmanned maritime systems. In this document, UMV, UAV, and other unmanned military vehicles or equipment are primarily designed to operate effectively and integrated in the near future. Aside from the technical aspect, the US government further touch the legal dimension by specifying that all UMS operations in the US water have to comply with existing regulations and rules, especially the inland navigational rules that were made by the US Coast Guard (USCG). In other water zones outside US territory or so-called international waters, these UMS have to comply with all rules stipulated in the LOSC and other maritime related instruments. In addition to those previous documents, several attempts on the national scale of the US have been conducted to regulate the operation of UMS in the marine area. The compliance obligation, as stipulated in the Unmanned Systems Integrated Document, was boldly restated or reissued by a national advisory council, called Navigation Safety Advisory Council (NAVSAC). NAVSAC further issued a recommendation to USCG to ensure every UMS comply with the existing regulation on navigation.[41]

Unlike USA, there has been no specific regulation on the military operation of UUVs, both in the UK and China.[42] According to an unmanned maritime systems expert, Dr. Dale Richards, there is a push for UUV in the UK to be integrated into existing infrastructures and also regulatory frameworks. Hence, it indicates that the development of UUVs are not followed by regulations. However, along with other institutions, Royal Navy has constituted regulation concerning unmanned ground vehicles, which can be used as a reference for the incoming UUVs regulation in the near future. Similar to NAVSAC, Royal Navy principally considered UUVs as conventional vessels or merely an extension of such vessels operating at sea. For this reason, these UUVs must be operated in accordance to the existing rules and regulations. However, due to UK restricted nature of some government reports, it is still unknown to what extent UUVs operation can be fitted in existing mechanism.

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41 Department of Defense, Unmanned Systems Integrated Roadmap FY2013-2038, Washington: Department of Defense, 2013.

42 Parliamentary Office of Science & Technology, House of Parliament, "Automation in Military Operations," POST Note, No. 511, Oktober 2015.

IV. VARIOUS STATES PRACTICES ON MILITARY APPLICATION OF UNMANNED UNDERWATER VEHICLES

A. UNITED STATES

UUVs have been consistently deployed by the US Naval Forces for the last two (2) decades. Started from the Iraq and Vietnam War, the US Navy had deployed many UUVs in most regions, for instance the UUV MK 18 MOD 2 Kingfish in the Middle East waters,[43] or the UUV Seafox in a particular mission related to mine clearance in the Persian Gulf.[44] Furthermore, US Navy and Department of Defense are currently planning to deploy more UUVs in the Asia Pacific waters.[45] For years, the US Navy has been organizing joint military exercise in the Arabia Sea and to be specific, in Pacific Rim exercises where UUVs had been deployed for the purpose of MCM.[46] Moreover, according to a recent report, US Navy has been periodically operating UUVs in the waters near Northern Europe and Mediterranean Sea.[47] However, UUVs recent operations which were conducted by the US Navy in the South China Sea attract more attention from international community than the aforementioned areas. In addition, China have strictly opposed these operations due to the risk of this technology posed to maritime safety and national sovereignty. Moreover, one international incident between USA and China has arisen out of this situation in the Philippines waters.

[43] Brett Daniel Shedadey, "Expanding Underwater Military Force: Unmanned Undersea Vehicles," http://inhomelandsecurity.com/expanding-underwater-military-force-unmanned-undersea-vehicles/m, accessed on 18 June 2017.

[44] Naval-technology.com, "SeaFox Mine Disposal Unmanned Underwater Vehicle (UUV), Germany", available at: http://www.naval-technology.com/projects/seafox-mine-disposal/, accessed on 18 June 2017.

[45] Department of Defense, "Remarks on 'America's Growing Security Network in the Asia-Pacific' (Council on Foreign Relations)" available at: https://www.defense.gov/News/Speeches/Speech-View/Article/716909/remarks-on-americas-growing-security-network-in-the-asia-pacific-council-on-for/, accessed on 18 June 2017.

[46] Heiko Borchert, "Why Undersea Drones Will Not (Yet) Change Asia-Pacific's Undersea Balance", available at: https://amti.csis.org/undersea-drones-will-not-yet-change-asia-pacifics-undersea-balance/, accessed on 18 June 2017.

[47] Bryan Clark, *et al.,* Restoring American Seapower: A New Fleet Architecture for the United States Navy*,* (Center for Strategic and Budgetary Assessment, Washington, 2017).

The incident lasted for six (6) days and further deteriorated these states bilateral relation, especially on the South China case, for some time.[48]

B. CHINA

Compared to the US Navy, UUVs application in PLAN military operations is still vaguely known. However, based on some reports, for the purpose of surveillance, intelligence gathering, and ever present threats in the disputed waters, PLAN have sent some UAVs and UUVs in the South China Sea and East China Sea.[49] The most notable and common UUVs utilized in these military missions are UUV Zhizhui-III. On the other hand, the China Government interestingly oppose foreign military operation involving UUV uses in their waters and surrounding waters. Before the South China Sea incident arose, the Government of China had detained an unidentified sea object in their territorial sea. The object itself was caught by local fisherman in marine areas near military site of China and handed to relevant authorities subsequently. Responding to this finding, the China Government confirmed and claimed that this object was intentionally placed to conduct surveillance and intelligence gathering in Hainan surrounding areas, which is one of the most complex military (PLAN) site.[50] However, after looking into this case, there has not been any further clarification from the China Government on the ownership status of that spying UUV.

C. UNITED KINGDOM

The Royal Navy of United Kingdom (UK Naval Forces) has been deploying the UUVs in outer part of their waters territory for a long period of time. Despite the fact that the location of these operations were not clearly identified in the report, Royal Navy had been definitely

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[48] Sam LaGrone, "China Returns U.S. Navy Unmanned Glider", available at: https://news.usni.org/2016/12/20/china-returns-u-s-navy-unmanned-glider, accessed on 28 May 2017.

[49] Elsa Kania, "The Next South China Sea Flashpoint: Unmanned Systems," available at: http://thediplomat.com/2016/12/the-next-south-china-sea-flashpoint-unmanned-systems/, accessed on 18 June 2017.

[50] Tyler Rogoway, "What is This Mysterious Underwater "Robot" that A Chinese Fisherman Caught?" available at: http://foxtrotalpha.jalopnik.com/what-is-this-mysterious-underwater-robot-that-a-chine-1725865223, accessed on 18 June 2017.

operating UUV REMUS for more than last ten (10) years and UUV RECCE, --owned by the Royal Navy's Unmanned Underwater Vehicles Unit-- since the year of 2010.[51] Furthermore, the most notable operation by RN is conducted in the Libya waters in the year of 2011. During this operation, Royal Navy ship, HMS Brocklesby deployed the UUV Seafox for the purpose of sea mines clearing, placed by the Qadafi militant, right in the Misrata Harbor.[52] These UUVs operations have also conducted in the Unmanned Warrior exercises (joint military exercises), which conducted biannually by the Royal Navy, other States naval forces, and military industries. Last, Royal Navy has also conducted a joint military exercise involving UUV Sea Fox, in particular MCM mission with the US Navy in the Arabian Gulf.[53]

D. OTHER STATES

In general, other than US, China, and UK, there are many other States conducting UUV's operation in the waters of Asia Pacific and other regions. However, it should be noted that these States,--namely Australia, Japan, Singapore, and Thailand-- have been deployed most of their UUVs in the maritime area to patrol their maritime border, not for surveillance and such military purposes in other States, as seen in the maritime powers practice.[54] In other regions, the international community have also witnessed the concrete steps from Norway, Sweden, and India to actively begin deploying UUVs for military purposes in their underwater domain. However, due to the passive nature of their UUVs, all aforementioned States have not shown and expressed their stance or perspective on the legal status of military UUVs and its implication on practice.

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[51] ROV World.com, "Royal Navy's new mine hunter UUV enters service", available at: http://www.rovworld.com/article4191.html, accessed on 18 June 2017.

[52] Jon Rosamond, "Plumbing the Depths: Unmanned Submersibles Come of Age", available at: https://www.stratfor.com/the-hub/plumbing-depths-unmanned-submersibles-come-age, accessed on 18 June 2017.

[53] Petty and Samuel Dodson, "U.K.-U.S. Mine Countermeasures Exercise 17-1 Concludes in Arabian Gulf", available at: http://www.cusnc.navy.mil/Media/News/Display/Article/1009608/uk-us-mine-countermeasures-exercise-17-1-concludes-in-arabian-gulf/, accessed on 18 June 2017.

[54] Heiko Borchert, see note 45.

V.CONCLUSION

As a result of this discussion, it can be argued that the legal status of Unmanned Underwater Vehicles (UUVs) deployed in military operations at sea is ambiguous under international law and thereby, dependent on the States perspective. As legal status is fundamental in determining all obligations and rights pertaining to the object, the ambiguity of military UUV legal status might result in more international incidents at sea in the future. In addition, various perspective on the issue among the States, or mainly between the Maritime Power and Coastal States, will enhance the possibility rate of such international incidents. Further issues on the capability of UUVs to comply with existing regulations, also need to be addressed by the international community.

It is highly recommended that the international community need identify and further address the issues of UUV's deployed in the military operation. Through discussions, either in the formal or informal forum, the international community will be able to decide whether military UUVs can be classified as warship, Government ship, or any other objects stipulated in the international law. As a result, this decision will illuminate all states on the legal implication of such UUVs. In addition, the international community should ensure that all UUVs can adapt to existing legal frameworks in order to preserve the safety navigation, peaceful uses of the sea, and other principles laid out in all maritime related conventions. The decision itself can be boldly issued by enacting a new regulation or making necessary amendment to the existing regulations. Should all of the aforementioned steps are not possible, the international community, along with non-government organizations can urge all States to adopt best practice and standard of UUV application in their national regulation. For this reason, the triple helix actors, such as government, academia, and company, need to cooperate to formulate the best practice and standard of UUV's application in the military and civil sector.

To conclude, this article can be served as a basis and/or insight for further and extensive legal research on unmanned maritime systems (UMS), both in the military and civil sector. In addition, addressing all of the related issues that were highlighted in this article is essential for the policy makers in formulating international policy on the military

UUVs.

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