LAKSHMAN KADIRGAMAR INSTITUTE
OF INTERNATIONAL RELATIONS AND STRATEGIC STUDIES

POLICY BRIEFS

Policy Briefs Series: No.15

LKI *Policy Briefs* are extended analyses on foreign policy issues.

Understanding the Evolution and Dynamics of Arms Races

Admiral Travis Sinniah*

June 2019

***Admiral Travis Sinniah** served as the 21st Commander of the Sri Lanka Navy and retired after 37 years of active service. The opinions expressed in this Policy Brief are the author's own and not the institutional views of LKI. They do not necessarily represent or reflect the position of any other institution or individual with which the author is affiliated.

About LKI *Policy Briefs*
LKI Policy Briefs are extended analyses on foreign policy issues.

Terms of use

Lakshman Kadirgamar Institute of International Relations and Strategic Studies
24 Horton Place, Colombo 7, Sri Lanka
Email: programmes@lki.lki. Website: www.lki.lk

Contents

As a number of great powers look to modernise their conventional and nuclear weapons systems, it is important to view such developments through a historical lens to understand the constantly evolving dynamics of an arms race. This *Policy Brief* further argues that Sri Lanka could build up its knowledge, planning, and diplomatic capacity on arms control issues to safeguard the territorial integrity of the island, and to support regional confidence building measures as a way to increase regional security and stability.

I. Introduction

War was at the core of all classical cultures, and the great civilisations exhibited power by means of projecting formidable armies, sea power, weapons, superior military strategy and novel tactics on the battlefield. A prominent scholar of the neo-realist school of international relations, and author of the term *'offensive realism,'*[1] John Mearsheimer, pointed out that little has changed in the dynamics of state behaviour since their formation. States, especially great powers, will engage in behaviour to maximise their strategic interests at the expense of smaller states.[2]

This approach is analogous with modern military thought, and any military tactician and commander would exercise command by seizing the moment of advantage, taking the initiative and accomplishing the task. Carl von Clausewitz's maxim that *"War is the continuation of politics by other means,"* in this regard still holds true.[3] The only difference being that men at arms conduct themselves with pride in their tradition, code and ethos, emphasising that nations exhibit power by wielding military capacity, and both comparison and competition will continue to grow as long as there is the thirst for power. Nevertheless, the race varies on the level of superiority in terms of the nation's global influence and the power projection it enjoys at that point of time.

II. The Evolution of Global Arms Races

The prominent strategic thinker and scholar of international relations, Colin Gray observed that "an arms race takes place if two or more hostile parties quickly increase or improve their weaponry and orientate their respective defence policies on the past, present or anticipated military and political behaviour of their opponent."[4] This pattern of behaviour has been consistent in most regions of the world today, and is particularly notable when states look to push for reorientation of defence policies and the modernisation of ageing weaponry. The security of even smaller nations depends on their defence forces being up-to-date with current technology, constantly evolving to counter perceived threats.

On the question of an ongoing arms race in the Indo-Pacific and the present militarisation in the region, it is imperative that one has a perspective of war, structuring of military forces, military strategy and weapons to appreciate the military impact on the projection and execution of power in this part of the world. When considering the evolution of global arms races, it is

apparent that there is a direct relationship between the development of industry, technology, and ensuing Revolution in Military Affairs (RMA).[5] It was true at the time of the great wars and remains consistent in current geopolitics as well. The only variance is that there are new players with changed strategic interests and the rules are being rewritten.

One need not probe too far into the past to identify when the term 'Arms Race' may have been introduced and its global implications since then. The last century has been turbulent and violent in terms of power and war, and the concept of an arms race commenced just before World War I broke out in 1914.[6] This first phase of an arms race can be traced back to the period when Great Britain and Germany initiated a naval arms race, aiding the evolution of the early twentieth century battleships, the 'Dreadnoughts.'[7] The growth of the industrial revolution brought forth a revolution in military affairs (RMA).[8] It was during this era that the then British Foreign Secretary Edward Grey opined that, what determined the Foreign policy of Great Britain was its sea power.[9] The significance of the relationship between foreign policy and sea power was also echoed by Admiral Alfred Thayer Mahan, in his seminal historic work on naval strategy, 'Influence of Sea Power upon History.'[10]

During the First World War, which engulfed Europe in widespread death and destruction, the predominant battlefield weapons were artillery and the tactical use of infantry in the form of trench warfare.[11] The use of sea and air power were limited. However, this war resulted in the estimated death of nine million recorded combatants and seven million civilians.[12] One should take into consideration that this was the result of a conventional war with weapons and tactics that could be measured as archaic and primitive in comparison to contemporary arsenals.

When the armistice was signed, the big four (Britain, France, US and Italy) saw to it that they imposed their terms of surrender on the defeated powers.[13] A series of treaties were implemented at the Paris peace conference in 1919,[14] the most infamous being the Treaty of Versailles.[15] The point here is that there were discourse and negotiation that brought about limitation and control of the weapon and warring platforms, in order to secure and stabilise a region affected by overly ambitious states. This was to actively prevent another arms race and negate conflict into the future.

The first arms race that began in the newly industrialised Europe was predominantly conventional in nature, aiming at having the largest seagoing platforms with the heaviest guns; this was consistent with the policy of colonisation through the projection of one's sea power. It was in line with the naval strategic thinkers of the time in perfecting fleets to protect home waters whilst simultaneously being capable of dominating distant seas.

The second industrial revolution of the twentieth century and the arms race that came with it led to the Second World War. The conflict unleashed a whole new RMA within the domains of conventional warfare and military organisation. The resultant casualties of the Second World War are estimated to be between forty and fifty million, making it the bloodiest conflict to date.[16] The atomic bomb alone killed an estimated 70,000 instantly.[17] The geopolitical impacts of the Second World War proved to be one of the most monumental power shifts of the

twentieth century. It cemented the Soviet Union's influence and power within the nations of Eastern Europe, and enabled the communist takeover of China.[18] More importantly, the pivotal shift arrived when the US reached a position of power, both in the economic and military domains.[19] In contrast, the European states, and the Soviet Union along with Japan, had their industrial and economic bases physically and financially decimated by the cost of war.[20]

In this instance, the RMA included improved air, sea and land weaponry. Air superiority and bombardment were used extensively along with mobile heavy artillery on the ground including tank warfare. Rockets and missiles were at a nascent stage of development, but were tested out with little success at the time. A new age of nuclear weapons was to begin.

The events of Hiroshima and Nagasaki in 1945, and the end of the Second World War paved the way for the succeeding arms race with the dawn of the atomic age.[21] The unprecedented bilateral nuclear arms build-up in the Soviet Union and the US, resulted in the formation of military doctrines such as MAD (Mutually Assured Destruction)[22] which brought the world dangerously close to the abyss of terminating the human experiment on several occasions. This assertion was also shared by former US Secretary of State, Robert McNamara who claimed that "at the end, we lucked out! It was luck that prevented nuclear war (during the Cuban missile crisis)."[23]

III. Nuclear Disarmament, Arms Control, and Non-proliferation in Retreat

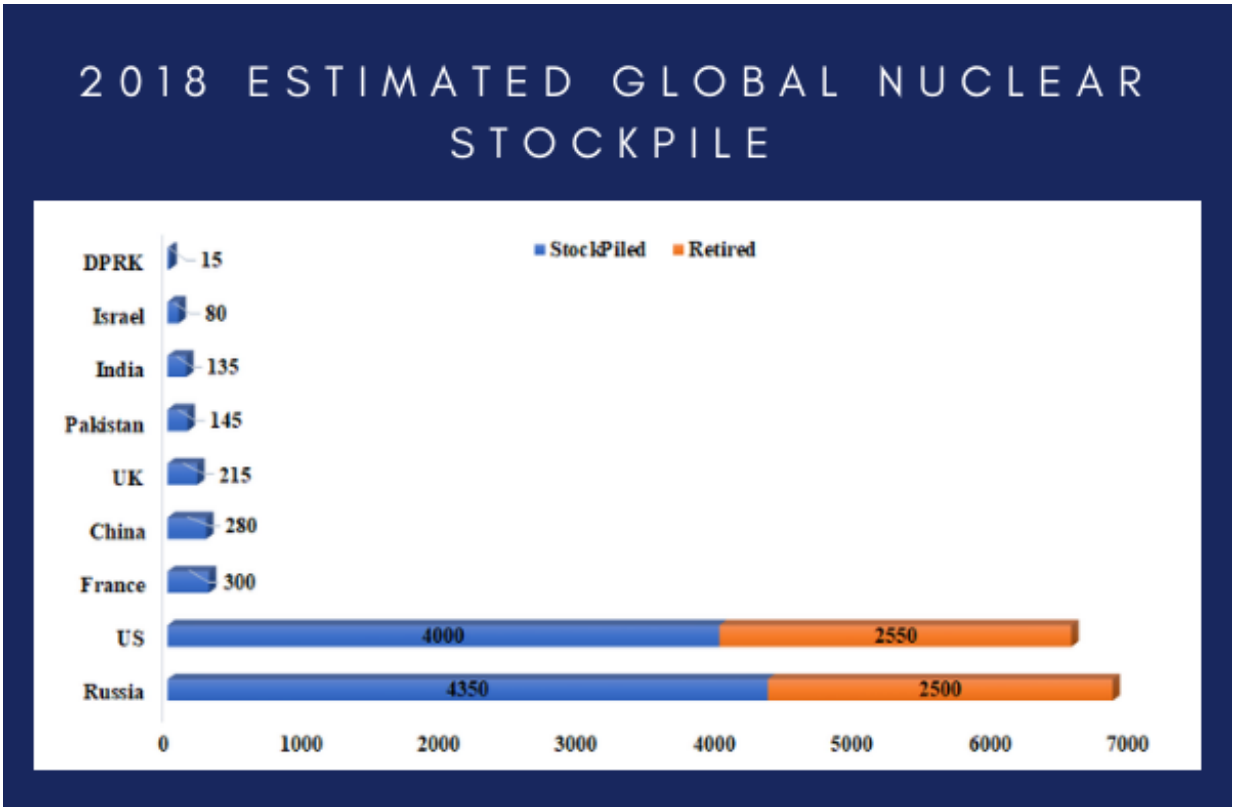
The global security landscape has undergone many changes since the end of the Cold War. The bilateral power struggle between the Soviet Union and the US has given way to the emergence of a multipolar world.[24] The emergence of China and India along with the violence perpetrated by non-state actors have radically altered and added new layers and challenges to global security governance architectures. In addition to the age-old nuclear weapons question, scholars and policy-makers are struggling to devise appropriate regulatory frameworks on emerging technology such as Lethal Autonomous Weapons Systems (LAWS), space weapons and the virtual war in cyberspace.[25]

After a period of considerable progress on bilateral disarmament, between the US and Russia, the nuclear order seems to be entering what nuclear weapons scholar, Vipin Narang, claims as the 'Third Nuclear Age.'[26] According to Narang, 2017-2018 marked a significant shift from the second nuclear age which lasted approximately 30 years that included a substantial mutual reduction in nuclear stockpiles. The nuclear order is experiencing a diversion, marked by the acquisition of nuclear weapons by rogue states such as North Korea, and the modernisation of nuclear weapons systems by all nuclear weapon holding states.[27]

The 2018 Nuclear Posture Review document released by the US Department of Defence signalled to the world that the US will look towards modernising their ageing systems, and change their policy on the deployment of its nuclear forces.[28] The document was notable for its advocacy for developing low-yield nuclear weapons,[29] and "modern" SLCMs (Sea Launched Cruise Missiles).[30] Furthermore, the document also underlined the US' reluctance to

ratify the Comprehensive Test Ban Treaty (CTBT),[31] as well as its marked opposition to the Treaty on the Prohibition of Nuclear Weapons (TPNW).[32] However, the most notable setback in the realms of arms control this year was the withdrawal of the US, and consequently Russia, from the Intermediate-Range Nuclear Force Treaty (INF).[33] The INF treaty is widely considered as one of the most successful arms control initiatives when it prohibited this particular class of lethal weaponry. It is paramount in this case as it avoids the use of nuclear weapons in a lower level of war and reduces the risk the operational level commanders being given the responsibility of deciding to take the nuclear option. In addition, there are indications that the US will either not extend or attempt to draft a new treaty extension to the New Strategic Arms Reduction Treaty (New START).[34]

Figure 1



Source: Arms Control Association[35]

IV. South Asia at the Nuclear Precipice

The twenty-first century has brought with it a different dimension in strategic thought, and a whole new interest in the Indian Ocean region. Powerful international actors have continued to embrace and influence the larger regional rivals, competing to win them over by providing economic and military aid. Even smaller states are not been ignored in the battle for influence and access. This has come about with the rise of China as an economic giant and the rapid development of the Asian tiger economies. Military wise, South East Asia has been in focus largely due to the disputes in the South[36] and the East China Sea bringing about an escalation in the military build-up in this region. However, this build-up in South East Asia is

predominantly conventional in nature and does not amount to an arms race, but rather a move into improved security and defence to safeguard the sovereignty and integrity of each individual state.

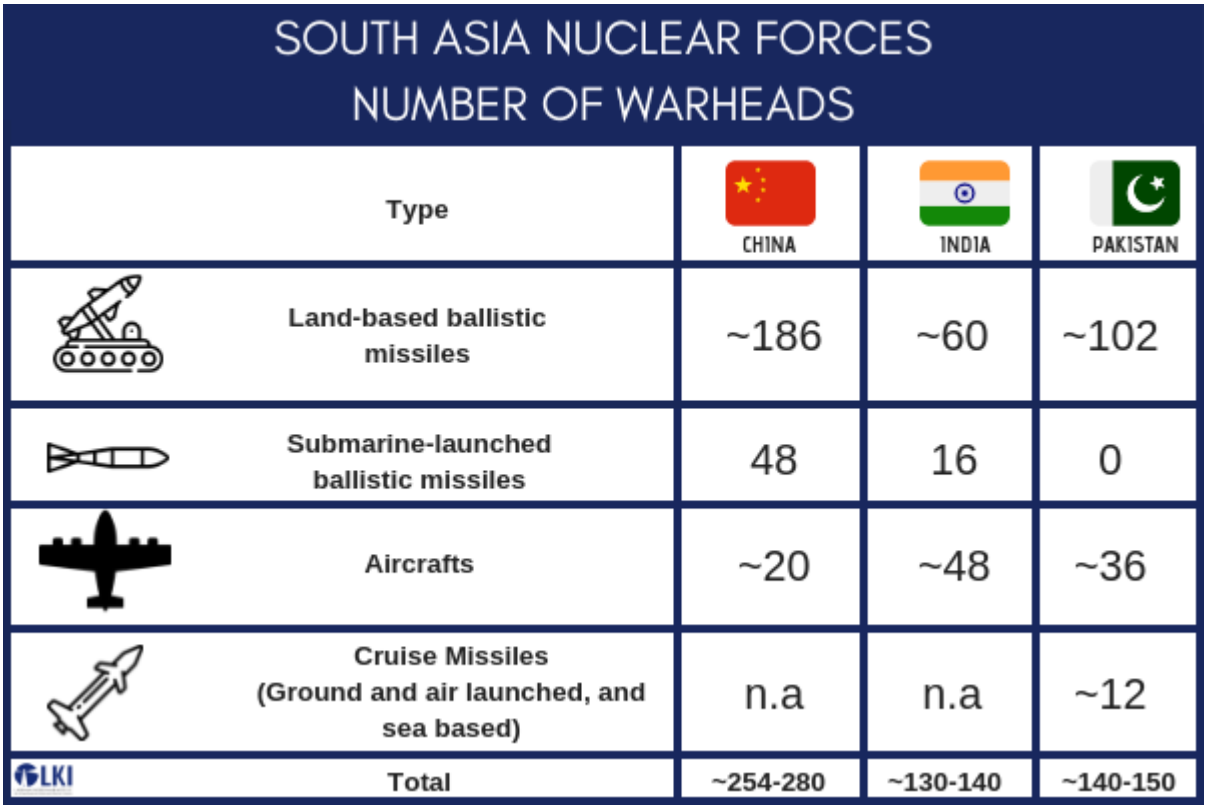
There seems to be no major threat of war or military instability of a serious nature for now in the South East Asian region. However, this does not imply that military modernisation is likely to improve stability in the region. It involves a number of risks for stability and security, due to the changing arms dynamic contributing to heightened regional militarisation and military counter-play. These are based not so much on an objective increase in the risk of attack or war in Southeast Asia, but rather on growing threat perceptions, especially among the littoral states of the South China Sea, where it still remains a geopolitical hotspot.

The situation in South Asia, on the other hand, is entirely different and has reached dangerous levels of tension. There is undoubtedly an arms race brewing between the South Asian giants India and Pakistan including their neighbours; China and Iran.[37] The dire issue, in this case is that, three of these countries are declared nuclear weapon holding states with two holding triad status.[38] The countries are also capable of producing weapons-grade radioactive material in their breeder reactors and continue to do so unchecked. The only exception being Iran that came under the supervision of the International Atomic Energy Agency (IAEA)[39] through the Joint Comprehensive Plan of Action (JCPOA) agreement,[40] which is perilously close to being dismantled with the withdrawal of the US.

Unlike the cold war rivals, the South Asian nuclear states have all engaged in military conflict with their neighbours over the last four decades with some of these bilateral conflicts having flared up on more than one occasion. The extremely short ballistic flight times[41] (under ten minutes) between the countries and the unresolved border disputes add to the constant tension of potential conflict from arising and moving up the nuclear escalation ladder at any given moment.[42] These nations also continue to procure new weapons systems and build up their own defence industry. For example, India is the world's second largest weapons importer[43] and China remains one of the largest exporters in the region.[44] In addition, with the ongoing revolution in sensing and targeting technology, countries are increasingly tempted to develop counterforce weapons to increase their chances of survivability in a nuclear conflict.[45] Counterforce weapons development could be a particular avenue of arms racing, as states will seek to increase its second-strike capabilities, through the potential development of more nuclear submarines (SSBN), and Unmanned Underwater Vehicles (UUV) in the future.[46]

India's primary threat, however, may not be Pakistan, but China – a rising superpower and economic rival with which it shares borders. On the other hand, China's nuclear motives are geared much more towards deterring the US and Russia. Meanwhile, the US has given India access to nuclear fuel on the international market[47] and China provides aid to Pakistan through technology to build its plutonium breeder reactors.[48] This sets the stage for a dangerous situation to brew in an already charged state of affairs. With both India and Pakistan in an arms race, it is easy to amplify the threat but it is much harder to pinpoint their real motive or policy in the use of nuclear weapons systems.[4]

Figure 2



Source: Data collected from the 2018 Nuclear Notebooks for India, Pakistan, and China compiled by the Bulletin of Atomic Scientists.[50] *(~ denotes approximate figures)*

The main vulnerability in South Asia is the close proximity of rival states, which are in an emotionally/politically/religiously charged state and have long-standing rivalry and hatred. This prevents them from engaging in rational negotiation, and for that reason, a lack of any bilateral policy in the use or limitation of their nuclear arsenal. The other area of concern is the disparity in comparative conventional military strengths which could drive the weaker states to consider the option of a first strike. Deterrence comes into play in South Asia only if parity is achieved in both conventional and nuclear forces of states matching up to each other. India holds a huge advantage in conventional forces in comparison to Pakistan and is rumoured to harbour a retaliation plan in case of a Pakistani attack dubbed the "Cold Start" doctrine.[51] The purpose of the Cold State doctrine is not to seemingly hold territory or threaten the existence of the Pakistani state, but to use devastating firepower to deliver a fitting blow that would fall short of provoking a nuclear response.

Pakistan's counter was to develop its short-range tactical battlefield nuclear weapon (TBM),[52] the Nasr or Hatf IX.[53] The availability of nuclear TBM means that, any incursion from India could be met with a nuclear response even if it meant Pakistan had to contaminate its own territory. The last nuclear weapon state to seriously consider the use of battlefield nuclear weapons was the US during the first decades of the Cold War when NATO forces were faced with the overwhelming superiority of Soviet conventional forces. But, by the early 1970s, the

US strategists no longer believed these weapons had any military utility, and by 1991 most had been withdrawn from European territory.[54]

Today, the US is reconsidering its strategy and the use of low yield and high yield weapons, the train of thought being that traditional arms control has changed with the digital age.[55] Nevertheless, the deployment of battlefield nuclear weapons makes a nuclear confrontation seem trivial, but the reality is that it could quickly escalate into a full-blown nuclear conflict. The chain of command, in this case, could be at the tactical level of war and the chances they would be used are higher. It would be foolhardy to believe that nuclear war could be limited to the battlefield if the opposition has the chance for a second strike. [56]

V. Implications for Sri Lanka

The implications to the neutral states in the South Asian region bordering or in the proximity of vital shipping lanes put them at risk of being directly or indirectly affected by any ongoing or aftermath of a nuclear explosion/or accident. Unfortunately, Sri Lanka is one of them and has no real contingency to deal with any nuclear mishap to its north or within its contiguous sea. The secondary implications due to any conflict between India, China or Pakistan impact Sri Lanka economically, diplomatically, and would certainly affect the way of life of the Sri Lankan citizenry. India is Sri Lanka's largest trading partner globally, while Sri Lanka is India's second largest trading partner in South Asia. On the other hand, Pakistan and China have provided the Sri Lankan military its largest stocks of defence material.

The relationship that Sri Lanka shares with these nations is one of a long-term friendship, but it puts Sri Lanka in a challenging position if a conflict does flare up between any one of them. Its strategic position in the Indian Ocean and the proximity to India places the island in the crosshairs, irrespective of the warring states. Being an island gives Sri Lanka a natural defensive boundary that shields its territorial integrity but it is well within a nuclear fallout danger zone if a nuclear weapon is used or in the case of a nuclear accident. For that reason, the state needs to consider realistic contingencies and be proactive in its foreign and defence policy, considering the likelihood of a conflict and its escalation to a nuclear war.

VI. Policy Recommendations for Sri Lanka

Sri Lanka has not seriously addressed the nuclear threat and conveniently believes that ignoring it will make it disappear. Unfortunately, it is a real threat and should be on top of the country's threat listing. Its current capacity to affect regional nuclear stability is somewhat inadequate and also a bit late in the day. It is time that Sri Lanka voices its concern on the dangerous behaviour of its nuclear-weapon-capable neighbours and demand regional security obligations, accountability and responsibility from them.

Sri Lanka in the past possessed an illustrious cadre of diplomats such as Jayantha Dhanapala,[57] who went on to become the United Nations Under-Secretary-General for Disarmament Affairs. However, Sri Lanka currently has a dearth of professionals well versed in the field of arms

control, and there is a need to re-build some of this capacity, particularly in the diplomatic sphere.

Beyond building up its diplomatic capacity, Sri Lanka could;

a. Develop Contingency Plans to combat nuclear and biological threats

While it may be futile and inconceivable to believe that Sri Lanka could successfully survive a nuclear conflict in its vicinity at present, it should at least strive towards a proactive CBRN (chemical, biological, radiological and nuclear) defence and preparedness doctrine against any radiological mishap in the region. The fact is that all other threats to the island fade in comparison.

b. Foster Regional Dialogue on Arms Control, and Nuclear Restraint

In recent years, the Ministry of Defence has been conducting annual symposiums on regional and global security matters, which include the Galle Dialogue (maritime), the Air Symposium (Aviation), and the Defence Seminar (land). These platforms of discourse should stress on CBRN threats and allow for serious debate and discussion.

Sri Lanka is an ideal neutral venue for regional dialogue on arms control and nuclear risk reduction in South Asia. Its cordial relations with all South Asian countries as well as other international players provide the opportunity for rival countries to meet and understand each other. This could pave the way forward for discussion and implementation of measures that may assist in finding a way out of the current nuclear security impasse in the South Asian region.

c. Upgrading the Sri Lanka defence forces to respond to CBRN threat

It is paramount that this threat is earnestly evaluated by the Ministry of Defence and the government, including other strategic think tanks in Sri Lanka, and an island-wide contingency plan be laid out without delay. Basic CBRN detection and protective gear need to be acquired and the population must be educated and informed. It is reasonable to demand that Sri Lanka's neighbours take responsibility in providing training and equipment as a part of their commitment to regional security and stability to neutral states within the danger zone.

VII. Conclusion

Neutrality and non-alignment have always remained key tenants of Sri Lanka's foreign policy. However, this long-standing practice as a form of official policy should be subjected to harsh examinations with respect to its integrity and longevity. Whether Sri Lanka's neutral stance and sovereignty will be sustained, as dictated by the military necessity of warring states, remains a key security question. It is, therefore, pertinent that Sri Lanka voices its concern on

the nuclear issue and ensures that international pressure is exerted on its neighbours to act sensibly, and invite them to the negotiating table to outline responsible agreements similar to those during the Cold War. This would at least be a starting point.

Notes

[1]Gowan, P. (2002). *A Calculus of Power*. [Online]New Left Review. Available at: https://newleftreview.org/issues/II16/articles/peter-gowan-a-calculus-of-power [Accessed 10 April 2019].

[2] Mearsheimer, J. (2001). *The Tragedy of Great Power Politics*. W. W. Norton & Company, New York.

[3] Clausewitz, C. V. (1982.) *On War*. Princeton University Press, New Jersey. [Online] Available at: http://home.sogang.ac.kr/sites/jaechun/courses/Lists/b7/Attachments/30/(week%202_%20week%203)%20Clausewitz%20On%20War%20Longer.pdf [Accessed 10 April 2019].

[4] Gray, C.S. (1971). *The Arms Race Phenomenon*. [Online]World Politics. Available at: http://www.cambridge.org/core/ services/aop-cambridge-core/content/view/ B780FDD0C24BCD543FC27129DB6ACC93/S004388710000151[Accessed 10 April 2019].

[5]Ibrügger, L. (1998). *The Revolution in Military Affairs*. [Online] Information Warfare Site.Available at: http://www.iwar.org.uk/rma/resources/nato/ar299stc-e.html. [Accessed 10 Apr. 2019].

[6] David, S. (2012). *How Germany Lost the WW1 Arms Race*. [Online] BBC. Available at: https://www.bbc.com/news/magazine-17011607.[Accessed 10 Apr. 2019].

[7] Golson, J. (2014). *The WWI Battleships that Saved (and doomed) the British Empire*. [Online] Wired. Available at: https://www.wired.com/2014/08/the-wwi-battleships-that-saved-and-doomed-the-british-empire/ [Accessed 10 Apr. 2019].

[8]Breemer, S., J. (2000). The *Real Revolution in Military Affairs/ Understanding Paralysis in Military Operations*. [Online] Center for Strategy and Technology Air War College. Available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/a425528.pdf. [Accessed 10 Apr. 2019].

[9]Rubin, G. (1956). *Liberal Criticism of Sir Edward Grey's Foreign Policy*. [Online] McGill University.Available at: http://digitool.library.mcgill.ca/webclient/StreamGate?folder_id=0&dvs=1553609519643~724 [Accessed 10 Apr. 2019].

[10] Mahan, A. T. (2010). *The Influence of Sea Power Upon History, 1660-1783*. Cambridge University Press. [Online]. Available at: https://www.cambridge.org/core/books/influence-of-sea-power-upon-history-16601783/C3F2700EA234A6BB03CE08BFB53F86E5

[11]Dunleavy, B. *Life in the Trenches of World War 1*. [Online]History. Available at: https://www.history.com/news/life-in-the-trenches-of-world-war-i [Accessed 10 Apr. 2019].

[12]Robert Schuman European Center. (2011). *World War 1 Casualties.* [Online] Available at: http://www.centre-robert-schuman.org/userfiles/files/REPERES%20%E2%80%93%20module%201-1-1%20-%20explanatory%20notes%20%E2%80%93%20World%20War%20I%20casualties%20%E2%80%93%20EN.pdf [Accessed 10 Apr. 2019].

[13]Cornish, P. (2018). *How did the Armistice end the First World War?* [Online]Imperial War Museum. Available at: https://www.iwm.org.uk/history/how-did-the-armistice-end-the-first-world-war [Accessed 10 Apr. 2019].

[14]Nelson. R. (2019). *The Paris Peace Conference begins* -Archive January 1919. [Online]The Guardian. Available at: https://www.theguardian.com/world/from-the-archive-blog/2019/jan/09/paris-peace-conference-first-world-war-1919. [Accessed 10 Apr. 2019].

[15]Library of Congress. (1919). *Treaty of Versailles*. [Online] Available at: https://www.loc.gov/law/help/us-treaties/bevans/m-ust000002-0043.pdf. [Accessed 10 Apr. 2019].

[16]Schuman European Center. (2011). *World War II Casualties*. [Online] Available at: http://www.centre-robert-schuman.org/userfiles/files/REPERES%20%E2%80%93%20module%201-2-0%20-%20explanatory%20notes%20%E2%80%93%20World%20War%20II%20casualties%20%E2%80%93%20EN.pdf. [Accessed 10 Apr. 2019].

[17]McCurry, J. (2015). *Hiroshima Remembers the Day the Bomb Dropped.* [Online]The Guardian. Available at: https://www.theguardian.com/world/2015/aug/05/hiroshima-prepares-to-remember-the-day-the-bomb-dropped [Accessed 10 Apr. 2019].

[18]MacFarquar, R. (2017). *How Mao Molded Communism to Create a New China*. [Online] The New York Times. Available at: https://www.nytimes.com/2017/10/23/opinion/how-mao-molded-communism-to-create-a-new-china.html. [Accessed 10 Apr. 2019].

[19]Babones, S. (2015). *American Hegemony is here to Stay*. [Online] National Interest. Available at: https://nationalinterest.org/feature/american-hegemony-here-stay-13089 [Accessed 10 Apr. 2019].

[20]Ibid.

[21]Cosmos. (2017). *Trinity: The Birth of the Atomic Age*. [Online] Available at: https://cosmosmagazine.com/technology/trinity-the-birth-of-the-atomic-age. [Accessed 10 Apr. 2019].

[22]Nuclear Files. *Mutual Assured Destruction*. [Online] Available at: http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/history/cold-war/strategy/strategy-mutual-assured-destruction.htm. [Accessed 10 Apr. 2019].

[23]*The Fog of War*. (2003). [Film]. Errol Morris. dir. US: Sony Pictures Classics.

[24]Burrows, M. (2017). *Western Options in a Multipolar World*. [Online] Atlantic Council. Available at: https://www.atlanticcouncil.org/images/Western_Options_in_a_Multipolar_World_web_1127.pdf. [Accessed 10 Apr. 2019].

[25]Chatila, R. and Tessier, C. (2018). *A Guide to Lethal Autonomous Weapons Systems*. [Online] French National Center for Scientific Research (CNRS). Available at: https://news.cnrs.fr/opinions/a-guide-to-lethal-autonomous-weapons-systems. [Accessed 10 Apr. 2019].

[26]Jacob. H & Narang.V. (2019). *Revolution in Military Affairs and India's Defence Preparedness*. [Online] The Wire. Available at: https://www.youtube.com/watch?v=AoLq856K8vQ. [Accessed 10 Apr. 2019].

[27]Ibid.

[28]Department of Defence. (2018). *Nuclear Posture Review*. [Online] Available at: https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF. [Accessed 10 Apr. 2019].

[29]The Guardian. (2019). *US nuclear weapons: first low-yield warheads roll off the production line.* [Online] Available at: https://www.theguardian.com/world/2019/jan/28/us-nuclear-weapons-first-low-yield-warheads-roll-off-the-production-line [Accessed 10 April 2019].

[30]. Ibid p.18.

[31]United Nations Office for Disarmament Affairs. *Comprehensive Nuclear-Test-Ban Treaty (CTBT)*. [Online] Available at: https://www.un.org/disarmament/wmd/nuclear/ctbt/ [Accessed 10 April 2019].

[32]United Nations Office for Disarmament Affairs. *Treaty on the Prohibition of Nuclear Weapons.*[Online] Available at: https://www.un.org/disarmament/wmd/nuclear/tpnw/ [Accessed 10 April 2019].

[33]Kimball, D. (2019). *The Intermediate-Range Nuclear Forces Treaty at a Glance*. [Online] Arms Control Association. Available at: https://www.armscontrol.org/factsheets/INFtreaty[Accessed 10 Apr. 2019].

[34]Reif, K. (2018). *New START Future Uncertain*. [Online] Arms Control Association. Available at: https://www.armscontrol.org/act/2018-01/news/new-start-future-uncertain. [Accessed 10 Apr. 2019].

[35]Davenport, K. (2018). *Nuclear Weapons: Who has what at a glance*.[Online] Available at: https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat [Accessed 10 Apr. 2019].

[36]Council of Foreign Relations. (2018). *China's Maritime Disputes*. [Online] Available at : https://www.cfr.org/interactives/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide#!/chinas-maritime-disputes?cid=otr-marketing_use-china_sea_InfoGuide [Accessed 10 Apr. 2019].

[37]Dalton, T and Tandler, J. (2012). *Understanding the Arms Race in South Asia. Carnegie Endowment for International Peace*. [Online] Available at: https://carnegieendowment.org/files/south_asia_arms_race.pdf [Accessed 10 Apr. 2019].

[38]Chopra, A. (2018). *India's Nuclear Triad: Meeting the Deterrence Challenge.* [Online] Indian Defence Review. Available at: http://www.indiandefencereview.com/indias-nuclear-triad-meeting-the-deterrence-challenge/ [Accessed 10 April 2019].

[39] International Atomic Energy Agency (2019). [Online]. Available at: https://www.iaea.org/ [Accessed 10 Apr. 2019].

[40]Arms Control Association. (2019) *The Joint Comprehensive Plan of Action (JCPOA) at a Glance.* [Online]. Available at*:* https://www.armscontrol.org/factsheets/JCPOA-at-a-glance [Accessed 10 Apr. 2019]

[41]Choudhury, U. (2001). *Dealing with the Danger of Ballistic Missiles in South Asia*. [Online] Carnegie Endowment for International Peace. Available at: https://carnegieendowment.org/pdf/npp/sabm.pdf#page=2 [Accessed 10 Apr. 2019].

[42]Jones, R. (2011). Nuclear Escalation Ladders in South Asia. Defense Threat Reduction Agency Advanced Systems and Concepts Office. Available at: https://www.hsdl.org/?view&did=716189 [Accessed 10 Apr. 2019].

[43]The Hindu. (2019). *India is World's Second-largest Arms Importer*. [Online] Available at: https://www.thehindu.com/news/national/india-is-worlds-second-largest-arms-importer/article26502417.ece [Accessed 10 Apr. 2019].

[44]Tian, N. (2018). *China's Arms Trade: a Rival for Global Influence?* [Online] The Interpreter. Available at: https://www.lowyinstitute.org/the-interpreter/chinas-arms-trade-rival-global-influence [Accessed 10 Apr. 2019].

[45]Lieber, K and Press, D. (2017). *The New Era of Counterforce: Technological Change and the Future of Nuclear Deterrence.* International Security. Available at: https://www.belfercenter.org/sites/default/files/files/publication/isec_a_00273_LieberPress.pdf [Accessed 10 Apr. 2019].

[46]Tate, A. (2018). *China Developing Large Autonomous Underwater Vehicles*. [Online] Jane's 360. Available at: https://www.janes.com/article/81960/china-developing-large-autonomous-underwater-vehicles [Accessed 10 Apr. 2019].

[47]Firstpost. (2017). *India-US Nuclear Deal: All you need to Know about the Landmark Agreement*. [Online] Available at: https://www.firstpost.com/india/india-us-nuclear-deal-all-you-need-to-know-about-the-landmark-agreement-3596209.html. [Accessed 10 Apr. 2019].

[48]Mian, Z. & Nayyar, A.H. (2009). *Playing the Nuclear Game: Pakistan and the Fissile Material Cut-off Treaty*. [Online] Arms Control Association. Available at: https://www.armscontrol.org/print/4162. [Accessed 10 Apr. 2019].

[49]Karnad, B. (2018). *India must Revise its Nuclear Policy and keep its Strategy Opaque.* [Online] Hindustan Times. Available at: https://www.hindustantimes.com/opinion/india-must-revise-its-nuclear-policy-and-keep-its-strategy-opaque/story-MRwcgzYXypIHf1j0V5iUoI.html. [Accessed 10 Apr. 2019].

[50]Bulletin of Atomic Scientists. *Nuclear Notebook 2018*. [Online] Available at: https://thebulletin.org/nuclear-notebook-multimedia/ [Accessed 10 Apr. 2019].

[51]The Economist. (2017). *What is India's "Cold Start" Military Doctrine?* [Online] Available at: https://www.economist.com/the-economist-explains/2017/01/31/what-is-indias-cold-start-military-doctrine [Accessed 10 Apr. 2019].

[52]Sokov, N. (2002). *Tactical Nuclear Weapons (TNW).* [Online] Nuclear Threat Imitative. Available at: https://www.nti.org/analysis/articles/tactical-nuclear-weapons/ [Accessed 10 Apr. 2019].

[53]CSIS Missile Defense Project. (2018). *Hatf 9 "Nasr".* [Online] Available at: https://missilethreat.csis.org/missile/hatf-9/ [Accessed 10 Apr. 2019].

[54]Kimball, D. (2017). *The Presidential Nuclear Initiatives (PNIs) on Nuclear Weapons at a Glance*. [Online] Arms Control Association. Available at: https://www.armscontrol.org/factsheets/pniglance [Accessed 10 Apr. 2019].

[55]Borghard, E and Lonergan, S. (2018). *Why are there no Cyber Arms Control Agreements.* [Online] Available at: https://www.cfr.org/blog/why-are-there-no-cyber-arms-control-agreements. [Accessed 10 Apr. 2019].

[56]Saetren, W. and Wilson, G. (2016). *No, You Can't Have a Small Nuclear War.* [Online] War is Boring. Available at: https://warisboring.com/no-you-cant-have-a-small-nuclear-war/. [Accessed 10 Apr. 2019].

[57]Crossette, B. (1995). *Man in the News: Jayantha Dhanapala; The Helmsman for the Nuclear Arms Pact*. [Online] New York Times. Available at: https://www.nytimes.com/1995/05/14/world/man-in-the-news-jayantha-dhanapala-the-helmsman-for-the-nuclear-arms pact.html?mtrref=www.google.com&gwh=37656E8CBE999ED6409E461D804D75AC&gwt=pay [Accessed 10 Apr. 2019].