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CENTRE FOR AIR POWER STUDIES

VISION

To be an independent **centre of excellence on national security** contributing informed and considered research and analyses on relevant issues.

MISSION

To encourage independent and informed research and analyses on issues of relevance to national security and to create a pool of domain experts to provide considered inputs to decision-makers. Also, to foster informed public debate and opinion on relevant issues and to engage with other think-tanks and stakeholders within India and abroad to provide an Indian perspective.

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Sreoshi Sinha

➤ EDITOR'S NOTE

The threat of use of the Countering America's Adversaries Through Sanctions Act (CAATSA) provisions by the President of the United States (POTUS) against India for signing the deal for the purchase of the S-400 air defence system from Russia appears to have abated for the present, although the last word on the same – as also on the import of oil from Iran by India – has not officially been said. Such a situation has arisen at a time when the US sees India as a 'key player' and a 'net security provider' in the Indian Ocean region – now expanded to include the Pacific in the new coinage of the term 'Indo-Pacific'.

The trade wars between the US and China are getting uglier by the day – the 90-day truce agreed upon by the two leaders on the sidelines of the G-20 Summit notwithstanding – with the arrest of Meng Wanzhou (the Chief Financial Officer (CFO) and heir-apparent of Huawei) in Canada on December 1, 2018. In a bid to protect a senior executive of one of the leading companies of China (Huawei is the largest telecom-equipment manufacturer in the world), President Xi has threatened the resumption of the trade wars.

Meanwhile, the strict admonition to Pakistan by the US – aimed at nudging Pakistan towards taking serious action to rein in terrorist activities from its soil, or face further financial setbacks (stoppage of financial assistance from the US) – has seen an immediate riposte by the Pakistani leadership. The almost spontaneous switch to another benefactor (China this time) – which has been more than forthcoming in its financial assistance to Pakistan for the China-Pakistan Economic Corridor (CPEC) and the development of the strategic Gwadar port – has left the US befuddled, to say the least. While Gwadar port lies in Balochistan and much of the CPEC also passes through Balochistan, the almost complete lack of their participation in these projects

has left the Balochis marginalised. This could have serious repercussions in the future for security in the region. Would the Chinese then join hands with the Pakistan Army and attempt a 'Xinjiang' in Balochistan to rein in the 'errant, non-conformist' Balochis? Only at their peril, one would imagine.

Another area where the Chinese and the Pakistan Air Force (PAF) seem agreed is the recent proposal to set up a Special Economic Zone (SEZ) under the CPEC to jointly produce a new generation of fighter jets, navigation systems, radar systems and on-board weapons. These would not only meet the future requirements of the PAF, but are aimed at weaning away the West Asian countries from US-supplied weapon systems. In a first, China has permitted full access to Pakistan for its Beidou satellite system, for civilian as well as military purposes.

Further, not to be left behind in the race (with its neighbour India) for sending a human into space, Pakistan's Information Minister, Fawad Chaudhry, stated in October 2018 that by 2022, with China's help, Pakistan would send its own astronaut into space.

Closer home, the Indian Space Research Organisation (ISRO) has launched the GSAT-7A, an advanced communication satellite that would operate in the Ku band to meet the network-centric warfare requirements of the Indian Air Force (IAF) along with those of the Indian Army (for its drone operations). The GSAT-7A will interlink all the ground-based radars, air bases and Airborne Warning and Control System (AWACS) aircraft of the IAF. The satellite will not only improve situational awareness for IAF pilots but also improve the sensor-to-shooter time.

With the recent seizure on November 25, 2018, by the Russian Navy of three Ukrainian Navy vessels that were heading towards the Sea of Azov, the ball has been put squarely in the European Union/North Atlantic Treaty Organisation (EU/NATO) court to impose upon Russia to permit freedom of navigation for the Ukrainian Navy and merchant ships in the Kerch Strait – and the Sea of Azov beyond – in keeping with the 2003 agreement between Russia and Ukraine about cooperation on all maritime matters relating to the Kerch Strait and the Sea of Azov. The annexation of Crimea by Russia in 2014 – in an attempt to 'restore Russia to the glory of its pre-Soviet days' –

is viewed by Ukraine as an attempt by Russia to assert its sovereignty over Crimea, and, by extension, over the Kerch Strait. Russia, on its part, is wary that unless it asserts its sovereignty over the Kerch Strait, Ukraine is likely to invite NATO ships into the Sea of Azov in the future. This fear is exacerbated by the fact that its annexation of Crimea has only been recognised by China, North Korea and Iran, but not by the US, Ukraine and a vast majority of nations. This drama in real life that is being played out by Russia – termed as a ‘gray zone’ conflict by many observers – is as much about a challenge to being termed a ‘revisionist’ power, as it is to asserting its claim over areas that were once a part of the former Soviet Union where a large number of Russians are living even today.

Is this an attempt by Russia to reassert itself and challenge the ‘New World Order’ brought about by the end of the Cold War? Russia does not believe that a few powers should decide the future of the world. While expressing its repugnance at the ‘double standards’ of the West, Russia feels under obligation to take up the cause of the marginalised societies that have been bearing the brunt of the West’s wrath in recent years.

In neighbouring Europe, the (move towards) the creation of a European Union Army that will be able to respond to a military threat developing to any member state of the Union has been proposed by President Macron and supported by Angela Merkel, the chancellor of Germany. With President Trump’s sharp rebuke to NATO last year to ‘pay more for their defence’, the US is increasingly being seen as an unreliable partner of NATO in case of outbreak of hostilities in Europe in the future. Formation of a European security council has been proposed by the German chancellor with a view that important decisions about European security could be taken faster.

The opening article in this winter issue by **Dhiraj Kukreja** talks about just such developments in the world that pitch the US on one side and the Russia-China combine on the other. The traditional allies of the US in Europe that had supported the former in all its ventures in the past appear not to be on the same page as President Trump in some of the major decisions he has made in his presidency.

The chief of staff of the US Air Force (USAF), while addressing the Air Force Association in 2016, was recounting his experiences during various campaigns that he had participated in through his career in the air force. He had drawn attention to the recent wars fought by the US military worldwide. While the US Army, US Navy or US Marine Corps had been involved in most wars jointly or singly, all the wars had one common thread: participation of the USAF in full measure. His point was simple. The air force can't win a war alone, but without the air force, no war can be won. Period.

The same sentiment is reflected in the IAF Doctrine 2012.

D Choudhury addresses the issue of salience of air power in India's future trajectory in the second article.

The IAF was created as an independent force on October 8, 1932, although its initial tasks were for reconnaissance and army cooperation. Through the various wars that India has fought since Independence, the IAF has played a stellar role in not only coming to the assistance of the Indian Army, but has also carried out its strategic tasks admirably. Counter-Surface Force Operations (CSFOs) are the epitome of jointmanship between an air force and its sister Service elements. Properly trained and equipped air forces can prove decisive in turning the tables against an enemy that might have greater strength in a particular sector during hostilities. Nothing exemplifies the role of the IAF in blunting an armoured thrust by the Pakistani armour better than what happened at Longewala during the 1971 India-Pakistan War. **JPS Bains** has captured the salient lessons from CSFOs carried out by the IAF during the various wars fought after Independence.

During World War II, control over own air defence weapons was a difficult task; there were several cases of fratricide as a result. The air space over the Tactical Battle Area (TBA) has become denser with the proliferation of unmanned air systems in recent years. Air defence weapons have become more lethal – with enhanced ranges – over the years, including those possessed by the army and also the navy. This has only added to the challenges of control over the air space in the TBA. While militaries learn their lessons during a war – often after suffering a few 'blue-on-blue' kills – this is certainly not the most efficient way to conduct war-fighting. Strict adherence to the rules of

the game in terms of control of air defence assets in the TBA is inescapable. **Anil Chopra** discusses the challenges for air space control and suggests the way forward in the next article.

In January 2007, when China carried out its Anti-Satellite (ASAT) test, we would have been none the wiser had it not been for the information provided by the US. Safety of Space-Based Assets (SBAs) is of great concern for a developing country like India. With the recent launch of the GSAT-11 – which is also considered India's most expensive satellite to date – the need to monitor 'threats' to own SBAs has become even more acute. It is important for India to participate in a joint venture with other 'friendly' (space-faring) nations to build this capability for the future. Similarly, the ambitious "Human in Space" programme that ISRO has embarked upon in pursuance of Prime Minister Modi's declaration during his Independence Day address to the nation this year has got the Institute of Aerospace Medicine (IAM) and ISRO to join hands and collaborate in making Mission Gaganyaan a success. **Anand Rao** reflects on the strides taken by the Indian space programme in the next article.

The drone policy in India is unique; with its NPNT (No Permission No Take-off), Indians appear to have found a temporary 'solution' to overcome the threat of drones flying into a 'no fly zone'. What is perhaps not realised by those who formulated this simplistic 'solution' is that a determined 'do-no-gooder' will fly his drone for the purpose that he intends to use it for – permission or no permission; unless, of course, some way is devised to link the starting mechanism electronically to the 'controller'. Unmanned drones have already been tested for carrying out autonomous missions. The problem that is envisaged is in situations when these drones have to interact with traditional forces. Will their Artificial Intelligence (AI) be intuitive enough to cater to all the contingencies that may arise in the mission, or will the drone, through machine learning, be able to adapt to the changed circumstances and yet carry out a successful mission?

With the more than 200 sightings of drones around Gatwick Airport from the evening of December 19 to December 21, hundreds of flights were cancelled and more than 140,000 passengers were stranded. This is the latest threat posed by drones to commercial aviation. Reliance on military systems for spotting the drones and for bringing them down indicates the seriousness of the threat.

While discussing the future of 'swarms', most countries agree that swarming is definitely the next Revolution in Military Affairs (RMA), and, therefore, they should not fall behind in this race and should develop the necessary competence in this technology. **Rajiv Narang** discusses the drone regulations as have been expounded by the Directorate General of Civil Aviation (DGCA) in the Indian context and offers his suggestions for the future to plug the policy gaps observed.

After the November 3, 2002, drone attack over Yemen which killed six Al Qaeda terrorists, the sound of a drone overhead in Yemen left citizens terrorised as they were not sure where the next 'bolt from the blue' would strike and cause death. Such was the fear that gripped the people of Yemen after the commencement of drone attacks by the US against suspected Al Qaeda operatives. And for good reason too. Were these targeted killings legal and justified in the eyes of International Humanitarian Law? Did the president of the United States have the authority to order such killings without a fair trial to the suspected terrorist being targeted? With the large number of innocents who have been killed (as collateral damage) in these drone attacks, international pressure seems to be mounting on the US president to stop these attacks. What has been the US response? These are some of the questions **Dipanwita** attempts to answer, along with the trajectory of American drone attacks in Yemen in the penultimate article in this winter issue.

Nuclear weapons were used for the first – and hopefully for the last – time in 1945. Their use, and the horrific death and destruction and misery that they caused brought about international abhorrence to ever consider their use again as it would be a slur on humanity. The International Court of Justice issued an Advisory Opinion in 1996 on the legality of the threat of use of nuclear weapons, or on their actual use. **Sreoshi Sinha** explores this path-breaking subject that is making its first appearance in the *Air Power Journal*.

Happy reading, and best wishes for the New Year.



A NEW WORLD ORDER: IS IT IN THE OFFING?

DHIRAJ KUKREJA

INTRODUCTION

Ever since the Berlin Wall came down on November 9, 1989, followed by the break-up of the USSR in 1991, the Cold War ended, and the USA has sat atop a unipolar world, unrivalled in its influence over the rest of the globe. However, since the last few years, the situation appears to be changing, as new, informal alliances have taken shape between nations or groups of nations with common interests. The erstwhile two great powers of the Cold War had their own interests at stake, but now the alliances have a mutual interest in overturning an international order that has long advantaged the West at their expense. As the world's sole superpower of two decades plus turns inward under the current presidency, these alliances could, or will, seek to take advantage and carve out areas of influence for themselves. Is a new world order in the offing, or will the countries and the alliances view each other with suspicion? Will these marriages of convenience last long enough to, once more, give rise to the bipolarity that the world had seen since World War II, or even multipolarity, or will the situation work loose in the face of natural rivalry rooted in geopolitics?

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It is ironical that while President Wilson believed in the League of Nations for collective security, the US Senate rejected membership to it! The League of Nations failed in its charter, and the phrase was sparingly used after World War II when plans were made for the formation of the United Nations Organisation.

The term 'new world order' has generally been used to refer to any new period of world history that displays a striking change in world political thought and the balance of power amongst nations. Notwithstanding the various explanations of the term, it is, for the most part, associated with an ideological concept of global governance, only in the sense of designating laws, rules, or regulations intended on a global scale, to identify, understand, or address issues that go beyond the capacity of individual nation-states to solve or resolve; this being achieved, not through a world government, but through various institutions of global governance, such as the United Nations, International Criminal Court, World Bank and others. It is, therefore, essential to understand the historical usage of the term.

HISTORICAL USAGE

One of the first and most well-known Western uses of the term was in Woodrow Wilson's Fourteen Points that called for a League of Nations following the devastation of World War I¹. The war had been a catalyst in international politics and it was felt by many that the nations of the world would not be able to coexist as they once had. World War I was considered to have granted the USA the right to dictate terms to make the world safe; President Wilson had insisted for a new world order, which rose above traditional power politics, and laid stress on collective security, democracy and self-determination. It is ironical that while President Wilson believed in the League of Nations for collective security, the US Senate rejected membership to it! The League of Nations failed in its charter, and the phrase was sparingly used after World War II when plans were

1. [https://en.wikipedia.org/wiki/New_world_order_\(politics\)](https://en.wikipedia.org/wiki/New_world_order_(politics)). Accessed on September 1, 2018.

made for the formation of the United Nations Organisation; however, the term was revived when assessing the creation of new international institutions, such as the US-Europe security alliance of the North Atlantic Treaty Organisation (NATO), International Monetary Fund (IMF), and International Bank for Reconstruction and Development (IBRD).

In recent times, the most widely discussed and used application of the phrase, 'new world order', came at the end of the Cold War, but without a developed definition. Presidents Mikhail Gorbachev of the USSR and George HW Bush of the USA, used the term to try to define the post-Cold War times, and the spirit of great power cooperation that they hoped might materialise. President Gorbachev's initial formulation was wide-ranging and idealistic, but could not advocate it, being severely limited by the internal crisis within the Soviet system. President Bush's vision was, in comparison, not less constrained: "A hundred generations have searched for this elusive path to peace, while a thousand wars raged across the span of human endeavour. Today, that new world is struggling to be born, a world quite different from the one we've known."² However, given the new unipolar status of the United States, Bush's vision was realistic: "...there is no substitute for American leadership."³

While the phrase 'new world order', as used to herald in the post-Cold War era, may not have been well defined, there, however, do appear to have been three distinct periods in which it was progressively redeveloped, first, by the Soviets, and later by the USA, before the Malta Conference, and again after President Bush's speech of September 11, 1990.

At first, the new world order dealt almost exclusively with nuclear disarmament and security arrangements; the phrase was subsequently expanded to include the strengthening of the UN and great power cooperation, on a

2. Archived copy of President HW Bush's speech before a Joint Session of Congress on September 11, 1990, available on <http://millercenter.org/president/bush/speeches/speech-3425>. Accessed on September 1, 2018.

3. Ibid.

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range of economic, security issues, with implications for NATO, the Warsaw Pact, and European integration being added thereafter. The Malta Conference held on December 2-3, 1989, collected these various expectations, and they were fleshed out in more detail by the media, which then included German reunification, human rights, and the polarity of the international system. However, it was the Gulf War – ‘Desert Storm’ – of 1991 that refocused the term on superpower cooperation and regional crises, when President Bush stole the initiative from President Gorbachev. The build-up of a UN consensus to permit action against Iraq was highlighted in the US media, when an editorial in the *Washington Post* declared that “this superpower cooperation demonstrates that the Soviet Union has joined the international community, and that in the new world order, Saddam faces not just the US but the international community itself.”⁴ The US capability to exert devastating military power and leadership over a multinational coalition provided the basis for American supremacy in a uniquely unipolar post-Cold War world. A new world order seemed to have arrived on the global scene!

RECENT POLITICAL USAGE

On April 19, 1994, during a World Affairs Council press conference at the Regent Beverly Wilshire Hotel in Los Angeles, Henry Kissinger, the veteran diplomat, stated, “The new world order cannot happen without US participation, as we are the most significant single component. Yes, there will be a new world order, and it will force the United States to change its perceptions.”

Leading to the turn of the century, the term ‘new world order’ has been referred to by various heads of state, in many forums, but mainly from the Western nations, to mean what was said by Henry Kissinger. In the aftermath of the infamous 9/11 terrorist attacks in the USA, former UK Prime Minister Tony Blair, during a speech on November 13, 2001, stated, “There is a new world order, like it or not”⁵, alluding to the terror

4. “Summit Decision Signals Superpower Cooperation”, *Washington Post*, September 2, 1990.
5. Archived copy of Prime Minister Tony Blair’s speech at the Lord Mayor’s Banquet on November 12, 2001, available on <https://web.archive.org/web/20090121063703/http://www.number10.gov.uk/Page1661>. Accessed on September 3, 2018.

attacks and the war thereafter to contain any such further action by state or non-state actors.

It was the maverick Iranian President Mahmoud Ahmedinejad who, in an interview with the Islamic Republic of Iran Broadcasting (IRIB), called for a new world order to break the influence of the Western nations. He noted that “it was time to propose new ideologies for running the world... based on world peace, global collective security, reciprocity and justice.”⁶ During the course of the interview, which came at the end of Israel’s 23-day offensive against Gaza that was widely condemned by the international community and also caused divisions within Israel’s political parties, he called the Western powers “tyrannical regimes and arrogant powers, whose policies in countries like Iraq and Afghanistan were failing.”

Power in international relations is defined in several different ways. The modern discourse generally speaks in terms of state power, indicating both economic and military power. The states that have significant amounts of power within the international system are referred to as small powers, middle powers, regional powers, great powers, or superpowers. Although there is no commonly accepted definition for what defines a powerful state, it is generally based on the influence that a nation-state can exert on the workings of the international system; NATO Quint, an informal decision-making group consisting of the USA and the Big Four of Western Europe (France, Germany, Italy and the United Kingdom), the G7, the BRICS nations (Brazil, Russia, India, China and South Africa) and the G20 are seen by academics as forms of governments or groups that can exercise varying degrees of influence on the global scale. Some scholars of international relations are of the opinion that the declining global influence of the US and the rise of nations and groups such as China, G20, BRICS, threatens the established norms and beliefs of the liberal, rule-based world order. They describe the three pillars of the prevailing order that are upheld and promoted by the West—peaceful

6. Archived copy of Iranian President Mahmoud Ahmedinejad’s interview with IRIB, February 17, 2009, <https://web.archive.org/web/20090219124613/http://www.presstv.ir/detail.aspx?id=85972§ionid=351020101>. Accessed on September 3, 2018.

Since the end of World War II, the US has been the central player in the international system, more so after the end of the Cold War, but with the current global trends championing “America First” isolationism and protectionism, President Trump has shifted the political mood towards selective engagement.

international relations, democratic ideals, and free-market capitalism—which are often opposed by such rising powers. The future of the international system, whether towards a ‘new world order’ or towards a ‘new world disorder’, or to something in between, is an open question.

IS US INFLUENCE WANING?

From pulling out of treaties to belittling allies to starting trade wars, the brash and often reckless actions of President Trump are flipping over the international order that has been in place since the end of World War

II. But even before Trump’s belligerent foreign policy positions, America had been gradually losing its dominant role in world affairs. A power shift among the nations of the world began at the end of the Cold War and has been accelerating in this century. It is not as simple as saying that “America is in a decline,” since America continues to remain a powerful country – economically, militarily and technologically—but American global power has been eroding for some time. Since the end of World War II, the US has been the central player in the international system, more so after the end of the Cold War, but with the current global trends championing “America First” isolationism and protectionism, President Trump has shifted the political mood towards selective engagement, where foreign commitments are limited to areas of vital US interest, and economic nationalism is the order of the day, leading geopolitical allies and challengers alike to pay close attention.

Within the USA itself, neither American political party has come to grips with this fast developing change. Until they do, US global actions are likely to be less effective, may be, even counter-productive. Not only do China and Russia contest America’s global role, a growing number of other countries

too is asserting an independent and increasingly influential role in regional economic and security developments. Growing tensions between the West and Russia, and between the US and China, go well beyond competing interests in eastern Ukraine or over once uninhabited rocks in the South China Sea.

A growing number of other nations too is asserting an independent and increasingly influential role in regional economic and security developments. The power shifts are ever more visible. In the Middle East, the US had hoped for decades to isolate Iran as a pariah nation and weaken the regime until it fell. Today, that goal is unimaginable, though National Security Adviser (NSA) John Bolton continues to imagine it is.

Iran is, and will continue to be, an increasingly assertive and influential power in the region, defending and promoting its interests and competing with the Saudi regime, notwithstanding the reimposition of sanctions. The Russians are in West Asia for good, well-entrenched and building on their long-standing relationship with the family of Syria's dictator. Turkey, a rising regional power, has been acting increasingly independent of the preferences of the US, its NATO ally, playing its own hand in the regional power game. It can be said that it was the US itself that lent a helping hand to unleash these trends with the strategically fatal invasion of Iraq in 2003 – fatal, because it permanently removed a regional leader who balanced the power of Iran. The failure, thereafter, to create a stable Iraq stimulated regional religious and political conflicts, and subsequent efforts to influence current trends in the region were rendered futile; the continually ineffective policies in Syria and Iraq are an existing example.

In Asia, decades of US condemnation and efforts to contain the rise of Chinese power have been unsuccessful. An assertive China has now risen,

China has now risen, playing an almost as powerful a role in the global economy as the US, unmindful of the trade wars initiated by President Trump. It has defended an authoritarian model for economic growth, armed artificial islands in the South China Sea and built a military base in Djibouti.

playing an almost as powerful a role in the global economy as the US, unmindful of the trade wars initiated by President Trump. It has defended an authoritarian model for economic growth, armed artificial islands in the South China Sea – ignoring the world opinion after the verdict against it by the Permanent Court of Arbitration (PCA) Tribunal—and built a military base in Djibouti. China has created new multilateral organisations for security discussions and one for infrastructure development through loans on easy terms. It has developed a global lending programme – the Belt and Road Initiative (BRI) –spreading its political and economic influence into many nations of Asia, Africa and Latin America. The US has not been able to slow down China’s economic growth nor contain its power; China is changing the rules, whether the US likes it or not.

President Vladimir Putin has been successful, to some extent, in asserting Russia’s interests and role in the world, like any other great power. Russia is consciously and actively attempting to rebalance the US influence, with threats to its near neighbours and active engagement in the Middle East.

Military power, the American global trump card, is not showing itself to be as useful a diplomatic tool as it once was. While the USA continues to have the world’s only global military capability with an ability to deploy anywhere, evidence that this capacity effectively sustains its leadership is, however, not visible. Clear military victories are few, the Gulf War in 1991 being an exception. The endless US deployment in Afghanistan carries the hint of Vietnam in its inability to resolve that country’s civil war; the war in Afghanistan is now the longest war in US history, continuing for 17 years! Meanwhile, the militaries of other nations, acting independently of the US, are proving effective, as both Turkish and Iranian operations in Syria suggest.

The transition to this new era is proving difficult for American policy-makers. In an era of globalisation, the ‘America First’ foreign policy is based on the viewpoint that the US needs to defend its interests by acting alone, eschewing or withdrawing from multilateral arrangements for trade,

economics, diplomacy or security. President Trump praises nationalistic leadership in authoritarian countries, while democratic leadership amongst the allies is criticised as weak! In response, the allies, to some extent, have distanced themselves from the US, while other nations have been emboldened to act in an equally nationalistic and assertive way.

Some conservatives like Senator John McCain (recently deceased), have called for a confrontation with China and Russia, while strengthening traditional alliances, particularly with NATO, Canada, France, and Germany, which have been with the US for many long years; others, like John Bolton, the NSA, have advised President Trump to take action for a regime change in assertive powers like Iran, which is now being attempted through a revocation of the nuclear agreement.

When it comes to foreign policy, President Trump's unpredictability just might be his greatest foreign policy asset. His opinion of international relations is as he saw reality television: "Unpredictability and absurdity raise the ratings, while turning over the players and never letting anyone forget who is the star of the show".⁷

President Trump came to power arguing that the country's foreign policy was an abject failure and the world was in a mess. He advocated in his 'America First' policy that it was no longer the US' responsibility to clean up the mess in the world, but to pursue its own interests; he wanted America's enemies to fear it, and its allies to pay their fair share for the protection provided. In a little over two years of his presidency, President Trump is up to his ears in foreign policy controversies, and showing no signs of being constrained. His second Secretary of State, Mike Pompeo, and the third NSA, John Bolton, are hawks who advise extreme action or reaction, while trade experts, policy veterans and diplomats from almost all the allied nations look on with trepidation.

President Trump's day-to-day unpredictability may be a bother for his own staff, but a grand strategist like Dr Henry Kissinger tends to consider it as an asset; known to advise President Trump on certain occasions, he seems to

7. "Present at the Destruction", *The Economist*, June 9, 2018.

In the last three decades or so, the world has witnessed historic events that have had tremendous impacts on the evolution of a new world order. The end of Communism in Eastern Europe, fall of the Berlin Wall, unification of Germany and disintegration of the USSR marked the collapse of the bipolar order and the end of the Cold War.

detect an opportunity in President Trump's unpredictability. His guidance centres on President Trump's quest to shape a new world order that has a chance at coping with centurial challenges in a rapidly changing environment – starting with a solution to one of the US' biggest headaches of the day, North Korea. Dr Kissinger visualises an emerging great power competition among the US, China, and Russia, which will define the international system in the coming years. As that competition intensifies, the Korean peninsula, wedged between empires, will inevitably come into play. While many countries find President

Trump's tactics deeply polarising, Dr Kissinger finds American overtures to North Korea being based on a deeper strategy that could usher in a balance of power with China in Northeast Asia. To him the USA remains inherently powerful but is no longer unrivalled, with China rapidly rising as a peer competitor, while a weaker and wary Russia, enticed by the prospect of a weakening US-led order, has strategically aligned itself with China. In the emerging bipolarity, the European Union (EU) is too divided to act as a mediator, while the emerging regional powers like Japan, India, and Turkey have yet to find a firm footing, leading to a state of disequilibrium. Unless the US can find a way to both coexist and balance against a rising China, Dr Kissinger and other political analysts feel that the century could bear witness to a new tragedy in great power politics.

THE EMERGING WORLD ORDER AND CHINA'S ROLE

In the last three decades or so, the world has witnessed historic events that have had tremendous impacts on the evolution of a new world order. The end of Communism in Eastern Europe, fall of the Berlin Wall, unification

of Germany and disintegration of the USSR marked the collapse of the bipolar order and the end of the Cold War. NATO's military intervention in the former Yugoslavia and its extension in Central and Eastern Europe – much to the annoyance of Russia – strengthened America's predominance in Europe. The signing of the Maastricht Treaty, establishment of the European Union, creation of a single European currency, and three rounds of EU enlargement, have made the European Union a big player in the international arena. The 9/11 terrorist attack started the War on Terror, getting

America into war in Afghanistan and Iraq. The global financial crisis in 2008 resulted in a worldwide economic downturn with the euro-zone debt crisis undermining the European economy, and even putting at risk the very existence of the euro for a time. As China initiated its economic reforms and openness in 1978, market-oriented changes have borne fruit: China maintained the highest economic growth rate in the world for many years, becoming one of the global economic powerhouses.

China as the growing giant of Asia has attracted attention towards itself; as per predictions, China has overtaken Japan as the world's second largest economy, with the Confucian wisdom being reflected in its pragmatic foreign policy to integrate itself in the world economy. China's ascent has fuelled its ambition to be a major world power and a regional superpower. With major changes underway in the world, the global order is evolving and remaking. To characterise the evolving world order is a great intellectual challenge in the strategic community; analysts have varying opinions over the issue, with some of the view that there is a world disorder rather than world order, while some observers still believe that the world is still unipolar! There also exists an assumption that the world has transformed into a multipolar world:

That the world order is moving from unipolarity towards multipolarity is almost accepted, with the main players of world politics being the US, China, the EU and Russia. Although America's relative influence is on the decline, it is still the sole superpower, with a strong alliance in both Europe and Asia.

Simon Tisdall opines that what has emerged is “a tripolar world”, dominated by the USA, a resurgent Russia, and China.⁸

That the world order is moving from unipolarity towards multipolarity is almost accepted, with the main players of world politics being the US, China, the EU and Russia. Although America’s relative influence is on the decline, it is still the sole superpower, with a strong alliance in both Europe and Asia. It has a well-functioning market economy and continues to be the largest economy in the world; with a dynamic financial system in place, the American dollar remains the largest international reserve currency. To support the economy, it has the strongest military strength and largest military expenditure, with China, however, fast closing in. China is spreading its tentacles of political and economic influence into Asia, Africa, and Latin America, with the US wanting, but unable, to decelerate the Chinese dragon.

Against this backdrop of a resurgence of protectionism through ‘America First’ by President Trump and the forthcoming Brexit in 2019, the Chinese president has called for a new type of globalisation. At the 19th Party Congress, in November 2017, President Xi Jinping called for a “community of shared human destiny”, elaborating China’s vision: “We call on the people of all countries to work together to build a community with a shared future for mankind, to build an open, inclusive, clean, and beautiful world that enjoys lasting peace, universal security, and common prosperity”.⁹ The proposition states that human beings have only one Earth and proposes that all nations must coexist in this shared space. Under President Xi Jinping’s idea, all countries should give due consideration to the legitimate concerns of other countries while pursuing their own interests, thus, making a mutually beneficial and win-win international partnership, as opposed to the current dominant conception of international

8. Simon Tisdall, “Munich Conference: Three Dangerous Superpowers – and We’re Stuck in the Middle”, <https://www.theguardian.com/commentisfree/2017/feb/19/munich-security-conference-nato-trump-russia-china-superpowers-europe-pig-in-middle>. Accessed on September 22, 2018.

9. Xi, Jinping, “Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics for a New Era”, Delivered at the 19th National Congress of the Communist Party of China http://www.xinhuanet.com/english/download/Xi_Jinping’s_report_at_19th_CPC_National_Congress.pdf. Accessed on September 23, 2018.

relations — namely, one of anarchy, power politics and a winner-takes-all dynamic. In China's proposed society, the world would continue in the general direction of economic liberalisation, but would also work towards a new global system that is more equitable, inclusive and fair, a community of shared human values and destiny in a shared process of globalisation.

Through this message to the world, President Xi Jinping has emphasised on the kind of role he sees for China in the emerging international order. The message is clear: China will be an architect of world peace, a stalwart of global development, and a staunch upholder of the international order. As for the way of diplomacy, China seeks communication rather than confrontation, while seeking partnership rather than an alliance, pursuing its independent and peaceful foreign policy, while defending its legitimate interests, and dedicating itself to construct a stable and balanced framework for relations with great powers. Such a message, as analysed by strategists, indicates the emergence of a key feature of a new world order, as scripted by China. To connect the world for free trade, China has launched initiatives like the One Belt One Road (OBOR), also known as the Belt and Road Initiative (BRI), for which it is using economic carrots and sticks with nations that cannot fund it through their territories. China hopes to gain influence through such moves; many nations like the Philippines are moving closer to China's orbit and benefiting from its economic largesse; however, such economic carrots come with a price — toeing China's political aims and diminishing political independence. Like it has done with South Korea, Norway, and Mongolia, China punishes nations that cross it politically, by stopping trade and by using its state-owned media to rally consumers to boycott foreign brands. China, through its ambitious plans, aims to connect the commercial worlds of Europe and East Asia via infrastructure links that will knit the vast landmass of Eurasia together.

To promote security for its trade, Chinese strategists advocate the country's rapidly modernising armed forces as essential, with the navy playing a central role for keeping potential adversaries away from its shores, while providing protection to its sea lanes. It is with this intention that China has armed the islands in the South China Sea as 'unsinkable destroyers' in

the event of an armed conflict. Western strategists, by contrast, advise a continuing presence in East and Southeast Asia because China's growing belligerence is unsettling the American allies. Hopefully, the USA will not fall in to the 'Thucydides Trap', (when a rising power causes fear in an established power which escalates toward war)!

CHINA'S SUCCESS IN MOULDING THE NEW WORLD ORDER AND INDIA'S PARTICIPATION

Can China really make an impact on the emerging new world order, despite the 'Trumpisms' emanating from the US? One needs to understand the desires of the Chinese leadership, notwithstanding its harsh dictatorial rule, and increasing military spending. China, today, is back on the world scene, after about a century and a half that includes Western imperial occupation, plunder by warlords, a Japanese invasion, civil war, revolutionary upheaval, and the recent phenomenal economic growth, and hence, has its own sense of being a great power. The world, however, is very different, with the USA still leading it, especially in China's own backyard in East and Southeast Asia, and is, thus, chary of accepting China as a great power.

China's new power position rests on an extraordinary increase in economic output since the late 1970s, when the market reforms were introduced. Over the same period, as defined by the World Bank, the number of Chinese people living in extreme poverty has fallen to 80 million, a tenth of what it used to be.¹⁰ China is the world's biggest trading nation, with an economy second only to that of the US; there is hardly a country in the world to which China is not either a source of consumer goods, or a destination for commodities and investments. It, therefore, wants, and as some grudgingly accept, deserves, a greater role in world affairs, more so in its immediate neighbourhood.

It is agreed that Asia needs a lot of improvement in its infrastructure. India itself is a partner with China in the New Development Bank (NDB) and the Asia Infrastructure and Investment Bank (AIIB). But the BRI is far more ambitious and widespread, making inroads into Europe and to an extent,

10. "Disorder under Heaven", a Special Report on Asian Geopolitics, *The Economist*, April 22, 2017.

coalescing Eurasia. The BRI, as it progresses, is becoming a debt-trap for the borrowing nations that cannot repay the Chinese loans, raising fears amongst sceptics that the borrowers would become Chinese strategic toeholds, as has happened in Hambantota in Sri Lanka. There is also the possibility of some borrowing nations turning against China; Malaysia has reneged on two major projects worth about \$ 22 billion, calling them scams of the previous regime. Pakistan, with the China-Pakistan Economic Corridor (CPEC), has empty coffers to repay its loans, mainly from Chinese banks and is desperate for a \$12 billion loan from the International Monetary Fund (IMF), which the US is objecting to as it fears a rescue attempt for the banks. China may step in and lend Pakistan the money (most of which will come back to it), but such a move will damage the credibility of the BRI (even as this piece was being written, while Pakistan has decided to review a railway project, a part of the CPEC, worth \$ 2 billion, it has managed a \$6 billion loan from Saudi Arabia and a \$1 billion loan from China, to tide over its immediate financial issues).

Most of the countries do not wish to accept the tough terms and conditions of loans from institutions such as the IMF; China, on the other hand, is offering huge loans on easy terms, but with some conditions. There are no global tenders; all contracts go to Chinese companies, most of which are state owned, as are the banks. Easy money from China once appeared lucrative, but the implosions of projects in Sri Lanka, Malaysia, and the Maldives, show how such easy loans can become burdens. In Sri Lanka, the Hambantota port did not pick up any business and soon became a white elephant; when the country defaulted on its loan, China wrote off a billion dollars in return for a 99-year lease – while it may be a financial disaster for Sri Lanka, it is a strategic triumph for China: getting a port in the Indian Ocean by luring Sri Lanka into a debt trap! Countries are normally sensitive to issues concerning sovereignty; even the USA has faced local hostility against its bases in Asia. Chinese strategic ambitions could be, thus, hit, further making Chinese loans for the BRI less attractive. Repeated defaults of loans could endanger the Chinese economy, which as it is, has the highest debt/GDP (Gross Domestic Product) ratio in the world of over 300 per cent. The 2008 financial meltdown

India also has a prominent role in promoting other causes, namely, climate change, digital cooperation and peace-keeping, either with the UN or another nation. China and Russia, on the other hand, are viewed with suspicion and, hence, do not have adequate moral clout as India has amongst the comity of nations.

has shown that even the richest nations can be severely affected by bad debts.

How and where does India fit into this geopolitical and economic quagmire? At one time, India and America did not see eye to eye on most international issues. US diplomats had a constant crib about India never voting with them at the UN. Times have changed and today India's voting pattern is no longer the complaint anymore; it is now about cooperation, deliberations and discussions to create consensus. India understands its position in the world hierarchy, given its economic strength, and is, thus, increasingly involving itself in international issues that

have domestic policy implications, unlike in the past, when it rallied around issues with little or no domestic impact. Climate change, widespread pollution, disease, drugs and digital turmoil, all have a profound effect on the average Indian.

During the writing of this piece, the Indian foreign minister was in the USA for the UN General Assembly meeting. During her visit to the USA, the minister joined President Trump in co-hosting an important meeting, along with a select group of countries on the spread of drugs; both the USA, and India have a serious drug addiction problem, with President Trump having declared a public health emergency last year. In the recent past, India and the USA have also cooperated to issue a political declaration on tuberculosis, permitting poor nations to use World Trade Organisation (WTO) authorised life-saving medicines. India also has a prominent role in promoting other causes, namely, climate change, digital cooperation and peace-keeping, either with the UN or another nation. China and Russia, on the other hand, are viewed with suspicion and, hence, do not have adequate moral clout as India has amongst the comity of nations.

CHALLENGES TO ESTABLISHING THE NEW WORLD ORDER

Recent years have brought deeply disturbing developments around the globe. As Robert Kagan writes in his book, "In the face of such disarray, a worst possible response based on a misreading of the world, American sentiment seems to be leaning increasingly toward withdrawal and looking inwards."¹¹ A Russian dictator, would-be European dictators, though elected, and a Chinese leader, who wields absolute power, all have a vision of transforming the world based on the model of their respective nations. It was once believed that economic success would eventually lead

to political liberalisation, that it is now seen how autocracies practise state capitalism that is compatible with repressive governance; geo-economics had replaced geopolitics but today geopolitics is seeing a return; the nation-state that was considered a relic in a world of globalisation and inter-connectivity, is now returning in emerging nationalism and protectionism.

As the world moves ahead in the 21st century, it faces challenges that are measurably worse than may be even five years ago. Increased war-related violence has given rise to a world order under challenge and rent by tensions; proxy wars in Ukraine and Syria are reminiscent of the Cold War era. The comforting factor is that the violence and proxy wars are not leading the world towards instability, since the conflicts are restricted to specific regions. There, however, are four issues, which demand immediate attention from international actors and the UN.

- New conflicts in West Asia and North Africa account for the overwhelming majority of the increase in global conflict fatalities. This is primarily due to the long ongoing civil war in Syria and the emergence of the Islamic State

11. Robert Kagan, *The Jungle Grows Back: America and the Imperiled World* (New York: Penguin Random House LLC, 2018).

of Iraq and Syria (ISIS) and other such terrorist groups in and beyond Syria, Iraq, Yemen and Nigeria.

- The involvement of the ISIS and other terrorist groups is a key factor in the increase in conflicts, leading to a complex new challenge to peace and security operations, and towards a new world order.
- The world today faces tensions in areas of strategic interest to regional, global and aspiring powers, such as in Eastern Europe, West Asia, Iran, Afghanistan and the Korean peninsula. Although the total global spending has remained largely unchanged since 2010 –around \$ 1.7 trillion¹² the rising Chinese and American arms spending portends risks ahead.
- Apart from violent confrontations, attacks in cyber space are a major cause of concern, with commerce, communications, individual privacy, Intellectual Property Rights (IPR), and critical infrastructure mainly vulnerable. Attacks in cyber space are difficult to trace and attribute, and even when they can be, legal and ethical questions persist on what constitutes proportional state response.

The recent intensification of great power competition, mostly dormant since the end of the Cold War, is a major challenge to the new world order. National and nationalist interests have exceeded economic competition and threaten the broader security environment. A resurgent Russia and the economically expanding China have both begun to push back on American dominance, although in very different ways. The leaders of both nations have expressed their intention to alter the international order, while the American leadership is intent on retaining its primacy, albeit through policy frameworks that do not seem designed to achieve that result!

CONCLUSION

The recent announcement of the withdrawal of the USA from the Joint Comprehensive Plan of Action (JCPOA), generally known as the Iran

12. Bruce Jones, Charles T. Call, Daniel Toubolets, "Managing the New Threat Landscape", *Brookings Foreign Policy Journal*, September 2018.

Nuclear Agreement, is having serious geopolitical repercussions, some direct in nature, while others more as collateral. In 2015, despite there being differences in perceptions, the USA, Britain, Germany, France, China and Russia, the P5+1, came together to finalise the Iran Agreement. In 2018, the USA has exited the deal unilaterally, not supported by its major Western allies, China and Russia. Thus, on the opposite sides of the fence, the move will further erode the American ascendancy in the world order and even accelerate the fragmentation of the order. China and Russia, too, do not agree with the US move and are not likely to agree to any renegotiation of the deal with Iran. This has further exacerbated tensions; the reimposition of US sanctions, and the declaration of a trade war with China, would, therefore, lead to an unravelling of global trade.

The fallout of the US exit from the Iran Agreement, the Paris Accord on Climate, and the Trans-Pacific Partnership (TPP) have led the relations amongst allies and among other major powers to become more transactional, leading to the dismantling of the post-World War II world order. The uncertainty and unpredictability in a changing scenario in the global geopolitical landscape is the reason, perhaps, pushing long-time adversaries such as North and South Korea to seek an end to their strained relations, unmediated by the great powers. This could also be the reason for China and India to moderate their adversarial relations and work together to soften the impact of global order uncertainties. New coalitions would emerge and also disappear as the old world order transforms and the new world order takes time to be established, demanding a nuanced approach by all the major players that want to support an effective multilateral order.

This is a time of serious challenge that will test the world ahead!

SALIENCE OF AIR POWER IN INDIA'S FUTURE TRAJECTORY

D CHOUDHURY

INTRODUCTION

Decades after having weathered wide ranging challenges, India today is on an upward trajectory, buoyed by stable and sustained economic growth. The foreign policy initiatives and stances taken in the recent past have drawn attention to the fact that India is not only a country with a vast market potential, but also one with a thriving democracy, and which is increasingly proving itself as a responsible world player committed to international growth and security. With the world focus having taken a perceptible shift towards Asia, India's comparative pairing with China is inevitable. Tapering economic growth, continued energy hunger, nationalistic assertiveness and geographic belligerence, supported by a rapidly modernising military, lay clear its true intentions behind *Zhongguyao heping jueqi*¹ or "China's peaceful rise". Despite inhibitions in openly admitting so, India's elevation to a great power status and a justified place on the international table, will most inevitably run into the Chinese gauntlet of its hegemonic ambitions. China, however, would most certainly balk at terming its foreign policy 'hegemonic' or 'ambitious', simply because of the deep conviction of its rightful position at the apex of the world order as an ancient civilisation.

Air Vice Marshal **D Choudhury**, AVSM, VM, VSM is Assistant Chief of the Air Staff (I) of the IAF.

1. Sujian Guo, "Challenges and Opportunities for China's 'Peaceful Rise'", January 9, 2006.

Despite inhibitions in openly admitting so, India's elevation to a great power status and a justified place on the international table, will most inevitably run into the Chinese gauntlet of its hegemonic ambitions.

The regional geopolitics of Asia has in the recent years been dominated by China. The One Belt One Road (OBOR) initiative to revive the ancient Silk Routes² is the centrepiece of its foreign policy and economic strategy. The OBOR aims to connect Asia, Europe and Africa along five routes. The Silk Road Economic Belt focusses on linking China to Europe through Central Asia and Russia; connecting China with the Middle East through Central Asia; and bringing together China and Southeast Asia, South Asia and the Indian Ocean. The 21st Century Maritime Silk Road, on the other hand, focusses on using its coastal ports to link China with Europe through the South China Sea (SCS) and Indian Ocean and connect China with the South Pacific Ocean.³ The increased Chinese activity and presence in the Indian Ocean, its actions in the SCS, the seemingly unconditional support of Pakistan and vast investment in the China-Pakistan Economic Corridor (CPEC) are all vital to its OBOR strategy. The significant aspect is that the all-important sea 'Roads' – which link it to European markets and Africa's vast resources – are more direct and faster than the overland 'Belts'. The \$46 billion CPEC which links China's Muslim-dominated Xinjiang province to the Gwadar deep-sea port in Pakistan is the key to its OBOR strategy as it effectively provides direct access to the Arabian Gulf. It is also a security challenge for India because it passes through Gilgit-Baltistan in Pakistan Occupied Kashmir (PoK).

India is located in a tough neighbourhood, landlocked from the rest of Asia from the north. Across the borders are two adversaries with whom it has fought five wars—four with Pakistan and one with China. Delhi's bilateral engagements with its immediate neighbours of Bhutan, Myanmar, Bangladesh, Sri Lanka, Nepal and even Afghanistan, have been offset by the strategic friendship of China and Pakistan; a friendship which has been, and will increasingly

2. http://en.ndrc.gov.cn/newsrelease/201503/t20150330_669367.html

3. HKTDC Research, "The Belt and Road Initiative", May 16, 2017.

be, used as leverage against India. From a security perspective, given the geography, it shares over 15,000 km of land border with its neighbours. Of this, 3,488 km is shared with China, 3,323 km with Pakistan and 106 km with Afghanistan⁴ which is subsumed in PoK. Thus, a total of 6,917 km of live borders tie down Indian land forces completely. Rapid improvements in both capabilities and capacities have taken place in the militaries – and especially the air forces – of Pakistan and China. This is important since Indian air power played a significant role in all the wars with Pakistan and would have played a vital role against China as well in 1962, had it been allowed to participate. Air power will certainly continue to play a vital role in all future conflicts, and especially so against China.

Rapid improvements in both capabilities and capacities have taken place in the militaries – and especially the air forces – of Pakistan and China. This is important since Indian air power played a significant role in all the wars with Pakistan and would have played a vital role against China as well in 1962, had it been allowed to participate.

THE TRANSFORMATIONAL CHANGES OF AIR POWER

To make a case for a greater role of air power, especially in the Indian context, its salience needs a revisit. Air warfare's greatest prophet, Giulio Douhet, stressed on "the openness of the sky and the speed with which aircraft could cross it". Armies followed roads and railways, and then had to fight their way through the enemy's defences. Navies were restricted to the sea and slowed by the heavy medium of water. He advocated, "Because of its independence of surface limitations and its superior speed, the aeroplane is the offensive weapon par excellence." His key thoughts are relevant even today: *air is a violent and crucial battlefield; the country controlling the air will control the surface; the third dimension will carry war to all people in all places; the psychological effects of air bombardment would be great.*⁵

4. http://www.mha.nic.in/hindi/sites/upload_files/mhahindi/files/pdf/BM_Intro_E_.pdf

5. Giulio Douhet, *The Command of the Air*, Translated by Dino Ferrari, New Imprint Air Force History and Museum Programme, 1998.

However, through both the World Wars, the Cold War era, the Vietnam and Korean conflicts⁶, air power remained subordinated to the surface forces. Even during the Arab-Israeli and the Indo-Pak Wars – where it was employed with decisive results – air power was still to remain an adjunct of the ground war. The 'Air-Land Battle'⁷ of the Eighties evolved out of the North Atlantic Treaty Organisation's (NATO's) war-fighting scenario, where the ground forces dictated the tactical battle. Deep battle or strategic attack was the preserve of the air force and the space between – the interdiction battle spaces – became the contentious area. The Gulf War⁸ was to bridge this gap, where air power seamlessly integrated the deep battle, the intermediate space and the tactical one. Military professionals, strategists, tacticians, thinkers and analysts the world over conceded that the war set new benchmarks. It brought out four invaluable lessons: the renewed relevance of air superiority; the vulnerability of strategic centres of gravity to air power; its ability to produce greater targeting effects across strategic, operational and tactical realms by simultaneous parallel operations; and, finally, the redefinition of the effects of 'mass and surprise' by 'stealth and precision'.

One fact which emerges clearly is that air power, having constantly evolved apace with technology, was no longer an adjunct (to the army), but a critical war-fighting imperative. Its capabilities have evolved rapidly, thereby expanding its roles, missions and tasks. The concepts of air operations consequently, have not only expanded and adapted rapidly, they will continue to do so in the future. The key transformational changes which air power has undergone can be summarised as:

- Use of air power is not necessarily escalatory. Unlike the early wars where involvement of the air force invariably meant 'ratcheting up' the scale of conflict in the escalatory ladder, this is no longer true today. The Kargil War is a classic case where, after the initial reservations of

6. William W. Momyer, *Air Power in Three Wars* (Air University Press, April 2003).

7. <http://www.au.af.mil/au/afri/aspj/airchronicles/aureview/1984/may-jun/romjue.html>

8. Edward C. Mann III, *Thunder and Lightning, Desert Storm and the Airpower Debates* (Air University Press, April 1995).

the political leadership⁹, air power was used extensively in a localised conflict, in which the Indian Air Force (IAF) was employed with a strict and constricting mandate of not crossing the LoC/IB (Line of Control/ International Boundary). Despite the politically imposed limited freedom of employment, it turned the tide by hastening the end of what otherwise would have been a protracted ground conflict; a conflict which we would have ultimately won, but with much greater losses of men and material. And, equally important, was the fact that the IAF, despite operating with strict rules of engagement, produced war-winning effects without giving the adversary any opportunity or space to escalate the conflict. This was possible due to its professionalism, where despite the loss of two aircraft and aircrew to man-portable surface-to-air missiles, and its naturally consequent pressures for retribution, the IAF strictly adhered to the political red lines. Air power, thus, has the distinct advantage of creating effects with precision standoff targeting and limiting collateral damage, without crossing borders or placing boots on the ground. Almost every major power today – the USA, UK, France, Israel, Russia, Italy, UAE, Jordan, Pakistan and even Saudi Arabia—has employed its air forces in localised or limited conflicts.

- It is indisputably the new opening batsman. The preparatory and mobilisation time lines needed for surface forces, which is in weeks if not months, give away the surprise and intent, and allow the adversary time to prepare. Air power, on the other hand, can act within hours. It is truly the first responder, which, with its speed, agility, reach and response, acts well inside the decision cycle of the adversary.
- It provides the vital war-winning asymmetry needed, especially against strong adversaries as in the case of the Arab–Israel War of 1967. While total air superiority is still the ideal desired end state, favourable air situation, local air superiority or air dominance are all equally acceptable for air power to create the vital asymmetric advantage needed by own surface forces against the enemy.

9. Jaswant Singh, *A Call to Honour: In Service of Emergent India* (New Delhi: Rupa & Co, 2006), pp. 203

Boots on the ground are still relevant, but large attrition of surface forces has become increasingly unacceptable the world over. Air power certainly cannot capture territory, but it definitely can reduce losses of ground forces by causing attrition of the enemy's military power before committing our own.

- Air power is no longer a 'mere supporter' but a 'dominant shaper' of war or conflict. From the opening rounds till conflict termination, air power has amply displayed its capability to actually shape the battle. It can prosecute a vast variety of roles, tasks and missions across the entire spectrum of warfare, whether deep into enemy territory, or across large continental or maritime spaces.

- A merger of operations has taken place where air power operates in parallel across the strategic-operational-tactical realms seamlessly. It has the ability to

simultaneously attack high value strategic centres of gravity of national power deep in the enemy heartland, interdict and destroy the vast array of vital counter-force and counter-value targets, infrastructure, logistics and communications, military and non-military targets in the intermediate space, and support the surface forces directly in the tactical battle areas and spaces. The unique ability to 'do' all three at the same time is what truly sets air power apart from other hard power tools of national power.

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THE DRAGON'S PSYCHE: SUN TZU AT WORK

To put the future role of air power in Asia in the correct perspective, a brief overview of the Chinese psyche is an important start point. Hu Jintao's policy of *Zhongguo heping jueqi* or 'China's peaceful rise' fuelled concern across the world with the use of the word 'rise'. Since 2004, the Chinese

leadership has, therefore, officially used the term '*Zhongguyao hepingfazhan*' or 'China's peaceful development', to alleviate international perceptions¹⁰. Notwithstanding the semantics, its transformation from a status quo approach to a revisionist one has been evident since then. The very use of the word 'peaceful' in its national policy was possibly an overt justification or a clarification of a covert intent. Being a nation which reveres a vision of its past as a leading ancient civilisation which was a 'central' or 'middle' kingdom in the world, it naturally venerates its thinkers and strategists like Confucius

and Sun Tzu. Aaron L Friedberg famously quoted, "Idiosyncratic history as a solitary great presence has left it with tacit assumptions of centrality and hierarchical superiority; Chinese decision-makers retain a stubborn faith in superior strategic wisdom found in ancient texts"¹¹.

While Sun Tzu's *Art of War* is essentially a military treatise, its applications have been widely applied in businesses and national strategies in the East. A few contemporary Chinese quotes and actions compared with Sun Tzu's precepts provide a valuable insight into their psyche:

Keep a cool head and maintain a low profile. Never take the lead - but aim to do something big.

— Deng Xiaoping¹²

10. Jason Buhi, *Foreign Policy and the Chinese Constitutions During the Hu Jintao Administration*.

11. Aaron L. Freidberg, 'The Source of Chinese Conduct: Explaining Beijing's Assertiveness', *Washington Quarterly*, Winter 2015.

12. Joseph Yu-Shek Cheng and Franklin Wankun Zhang, "Chinese Foreign Relation Strategies Under Mao and Deng: A Systematic and Comparative Analysis".

All warfare is based on deception. Hence, when able to attack, seem unable; when using forces seem inactive; when far away, make him believe we are near.

— Sun Tzu¹³

This was the policy approach adopted in the initial years of the Chinese economic rise, where the focus was primarily on creating a strong market base, expanding its energy basket and modernising its military. It is driven primarily by economic progress necessary to uplift its vast population into the middle class.¹⁴ In the past, it deliberately stayed out of international commitments expected of responsible major powers. It remained focussed on the strategic vision of becoming a great power comparable to the USA, filling the security void with the waning of American power¹⁵ and international influence. The pragmatic occidental mindset of the West possibly underestimated the idealistic oriental approach of its long-term strategy. China was clearly biding its time.

China's president Xi Jinping has taken on a new military title, in his latest move to exert greater control over the armed forces. Mr. Xi is now commander-in-chief of the military's joint operations command centre.

— BBC News April 21, 2016¹⁶

In war, the general receives his commands from the sovereign.

— Sun Tzu¹⁷

President Xi's series of actions to cleanse the People's Liberation Army (PLA) of corruption and gain firm control, underscores the belief that a strong military is vital to China's growth trajectory. The pace of his centralisation of power since the 19th Party Congress has caught even experienced China

13. Sun Tzu, Lionel Giles, *The Art of War* (Canterbury Classics, 2014).

14. Robert D. Kaplan, *Monsoon* (Random House, 2011), p. 330.

15. *Ibid.*

16. <http://www.bbc.com/news/world-asia-china-36101140>

17. Sun Tzu, n. 13, ch. 7.

watchers off-guard.¹⁸ The 'Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era' added into the Chinese Communist Party (CCP) Constitution at the Congress, has elevated him to the ideological authority of Deng Xiaoping and Mao Zedong through the inclusion of his name (an honour his two predecessors did not receive). An astute and ambitious politician, with a clear strategic vision of restoring China to its former glory, Xi has manoeuvred deftly to position himself not only as the 'the general' but as 'the sovereign' as well.

China's PLA sees US battle networks which rely heavily on satellites and the internet to identify targets, coordinate attacks, guide 'smart bombs' and more, as its 'Achilles heel.

— RAND Study¹⁹

Therefore, the skillful leader subdues the enemy's troops without any fighting; he captures their cities without laying siege to them; he overthrows kingdoms without lengthy operations in the field.

— Sun Tzu²⁰

The vast investments in cyber and space, with rapid advancements towards self-reliance have been a part of a long-term strategy. The Gaofen 4 is the world's most powerful geo spy satellite²¹. It has a colour image resolution of slightly less than 50m which is enough to track aircraft carriers by their wake at sea. Its coverage is a 7,000 km by 7,000 km box of 49 million sq km of Asian land and water, in and around China. When the Jilin constellation is completed in 2030, it will have 138 small satellites that provide a snapshot of any place on Earth every ten minutes. The Yaogan satellite constellation and its associated Anti-Submarine Ballistic Missile (ASBM) system provide

18. <https://thediplomat.com/2018/02/xi-jinpings-latest-power-move-in-context/>

19. Edmund J. Burke, Astrid Stuth *Assessing the Training and Operational Proficiency of China's Aerospace Forces* (Santa Monica, Calif: RAND Corporation, 2016).

20. Sun Tzu, n. 13, ch. 3.

21. <http://defenceforumindia.com/forum/threads/gaofen-4-the-worlds-most-powerful-geo-spy-satellite-popular-science.75198/>

it Anti-Access Area Denial (A2/AD) capabilities so as to keep US carrier strike groups well away from the Chinese mainland and SCS. In the cyber domain, its Strategic Support Force (SSF), combines cyber and electronic warfare specialists, along with intelligence, surveillance, reconnaissance and space experts of the PLA. According to RAdm Yin Zhuo of the PLA Navy, who is linked to the SSF's creation, its main task is "ensuring the military's local advantages in aerospace, space, cyber, and electromagnetic battlefields through operations, such as target tracking and reconnaissance, satellite navigation, attack and defence in cyber and electromagnetic spaces – the underlying goal of which should be attaining victory in future wars".²²

Chinese transgressions into the Indian border shot up considerably from 271 instances in 2016 to 415 transgressions in 2017, according to official reports.

— The Quint²³

Appear at points which the enemy must hasten to defend; march swiftly to places where you are not expected.

— Sun Tzu²⁴

India is the only country with which China has not resolved its border disputes and its erstwhile backburner approach has been replaced by more assertive actions in recent times. Historically, almost every official visit or event between India and China has coincided with a Chinese border violation or a territory related statement or action.²⁵ Days before Premier Li Keqiang was to visit India in May 2013, the Chinese forces transgressed into Depsang, Ladakh. Even when President Xi Jinping visited India in September 2014, his arrival was punctuated with the arrival of the PLA

22. <http://cimsec.org/strategic-support-force-chinas-information-warfare-service/27200>

23. <https://www.thequint.com/news/india/chinese-transgressions-face-offs-increase-along-lac-official-data>

24. Sun Tzu, n. 13, ch. 6.

25. D S Rajan, "Will Chinese Intrusions into India's Borders Ever End?" Paper no 5915, South Asia Analysis Group, April 14, 2015.

in Ladakh, where a tense standoff followed. The renaming of six places in Arunachal by China prior to the Dalai Lama's visit resonates of a Sun Tzu approach to its border issue with India. The 73-day-long Doklam faceoff underscored the '*unexpected*' approach, possibly testing India's resolve on its relations with Bhutan. While the crisis may have been averted, to many it provides "insights into Chinese coercive strategies and how they may be thwarted".²⁶

*The strategic concept of active defense is the essence of the CPC's military thought - China's military strategy.*²⁷

— Xinhua

Knowing the enemy enables you to take the offensive, knowing yourself enables you to stand on the defensive. Attack is the secret of defense; defense is the planning of the attack.

— Sun Tzu²⁸

Fighting a quick battle to force a quick resolution (QBQR or Suzhan Sujue); information dominance, precision strikes on strategic points, joint operations to gain victory; the basis of preparations for military struggle will be placed on winning informationized local wars.

— Current PLA strategy²⁹

If the campaign is protracted, the resources of the state will not be equal to the strain; there is no instance of a country having benefited from prolonged warfare.

— Sun Tzu³⁰

26. <https://www.rand.org/blog/2017/08/countering-chinese-coercion-the-case-of-doklam.html>

27. Full Text: China's Military Strategy, http://news.xinhuanet.com/english/china/2015-05/26/c_134271001.htm

28. Sun Tzu, n. 13, ch. 3.

29. Anthony H. Cordesman and Steven Colley, with the assistance of Michael Wang, "Chinese Strategy and Military Modernization in 2015: A Comparative Analysis", CSIS Report, October 10, 2015.

30. Sun Tzu, n. 13, ch. 3.

The Chinese leadership, realising the necessity of a strong air force as a vital element of its hard power, has invested heavily in its rapid modernisation and long-term growth. The PLAAF, in the recent years, has undergone a quiet and very significant transformation – from a tactical force towards a strategic one.

There can be little doubt that active defence and QBQR, enabled by joint operations in a networked battle space, are the cornerstones of China's new strategic outlook. The signs are clear: we are looking at a China which no longer shrouds its intentions and goals. Since there are innumerable such parallels which can be drawn, it leaves little doubt that Sun Tzu's *Art of War* is the common golden thread of the past and current Chinese strategy. The deep-rooted faith in Sun Tzu provides insight into the growing strength and trajectory of China's military, especially the

PLA Air Force (PLAAF). The Chinese leadership, realising the necessity of a strong air force as a vital element of its hard power, has invested heavily in its rapid modernisation and long-term growth. According to Friedberg, "China's military build-up, particularly the expansion of its long-range nuclear forces and its development of A2/AD capabilities, poses a serious threat to both the American position in East Asia, and the security of other regional powers."

RISE OF PLAAF: STRATEGIC TRANSFORMATION

The PLAAF, in the recent years, has undergone a quiet and very significant transformation – from a tactical force towards a strategic one. This has been possible due to the transformational leadership of two successive PLAAF Chiefs³¹, Xu Quiliang and Ma Xiaotian. Xu is the first PLAAF officer to become Vice Chairman (VC) of the Central Military Commission (CMC), a position which places him directly under General Secretary Xi Jinping. He is also the first PLAAF general to serve as the Deputy Chief of General Staff (DCGS). As VC, he is the front man of Xi's anti-corruption drive.

31. Burke, et al., n. 19.

His current position allows him to influence Chinese decision-making and advocate for the PLAAF behind closed doors. Ma is the first PLAAF officer to serve as commandant of the National Defence University, the highest military educational establishment directly under the CMC. It is committed to the joint education at the national security level for the PLA and civilian government agencies, policy consultation for strategic and defence issues and the development of mutual understanding, friendship and cooperation between the PLA and other armed forces. He is the second PLAAF

general to serve as the DCGS after Xu and as a member of the CMC. This new trend indicates the elevation of the PLAAF as an important element of its national power.

Xu was the first to roll out the tenets of the PLAAF's strategic goals and space capabilities: "The Air Force will extend its reach from the sky to space, from defence of Chinese territory to attack (of threats) as well. We will improve the overall capability to strike a long-distance target with high precision, fight electronic or Internet warfare with back-up from space . . . and deliver our military strategic assets".³² Five years later, Ma used the PLAAF's anniversary to rephrase these goals as a "powerful people's Air Force for integrated air and space operations that is capable of attack and defence and of providing a strong support for the realization of the China dream and the dream of making the armed forces strong",³³ to reflect Xi Jinping's priorities. Ma was quick to seize the opportunity of the East and South China Seas crises to showcase the PLAAF as an effective tool of Chinese national will and hard

The Pentagon revealed that China has built air bases capable of supporting PLAAF operations, 24 hardened aircraft hangars, plus other supporting infrastructure such as barracks and communications facilities.

32. Stephen Chen and Greg Torode, "China to put Weapons in Space", *South China Morning Post*, November 3, 2009.

33. Ma Xiaotian and Tian Xiusi, "Speed Up the Building of a Powerful People's Air Force for Integrated Air and Space Operations That is Capable of Attack and Defence-Studying Chairman Xi Jinping's Important Expositions on the Building and Development of the Air Force", *Seeking Truth*, October 30, 2014.

power. He successfully expanded the PLAAF's mission set to the maritime domain by writing, "The Air Force must be fully and clearly aware that the air actions for safeguarding maritime rights and interests bring about higher requirements for guidance on the employment of the Air Force, as well as Air Force building and comprehensive support; be fully and clearly aware of the importance of winning the initiative in the air struggle for effectively coping with various security threats from the maritime domain; be fully and clearly aware that the new situation in the maritime rights defence struggle brings about new requirements for the Air Force to quicken its transformation from homeland air defence to possessing both offensive and defensive capabilities".³⁴ A review of the PLAAF's maritime involvement in the recent years provides a clearer insight:

- On November 23, 2013, the People's Republic of China (PRC) announced that its "East China Sea Air Defence Identification Zone" (ECS ADIZ) would be effective at 10:00 am that same day. The ECS ADIZ asserted coverage of the air space over the Senkaku Islands, which are administered by Japan and claimed by the PRC as the Diaoyu Islands, and by Taiwan as the Diaoyutai Islands. The ECS ADIZ overlaps the existing ADIZs of Japan, the Republic of Korea (ROK), and Taiwan. It also warned that "China's armed forces will adopt defensive emergency measures to respond to aircraft that do not cooperate in the identification or refuse to follow the instructions." Despite international outrage, the PLAAF carried out 313 ADIZ patrols in 2013.³⁵
- On September 24, 2016, a total of 40 aircraft, including SU 30 aircraft, H-6K bombers, accompanied with air tanker aircraft flew in the Okinawa Strait.³⁶ Shen Jinke, a PLAAF spokesperson, noted that the drill involved "reconnaissance and early warning, attacks on sea surface targets, and in-flight refuelling to test the Air Force's fighting capacity on the high seas." A similar exercise was repeated on November 12, 2016, with the PLAAF exercising simultaneously in the Bashi Channel and Miyako Strait. This

34. Ibid.

35. "East China Sea Tensions Approaching a Slow Boil", file:///C:/Users/USER/Desktop/East%20China%20sea.html

36. Ibid.

prompted RAdm Yin Zhuo to claim that the PLAAF can now fight in two separate war-zones at the same time, based on its first simultaneous mission over two strategic locations beyond what China describes as the “First Island Chain”.

- The PLAAF has since deployed the KJ 500 Airborne Early Warning and Control (AEW&C) aircraft and J-11BH fighters in Woody Island³⁷ and airfields in the Spratly Islands. The Pentagon revealed that China has built air bases capable of supporting PLAAF operations, 24 hardened aircraft hangars, plus other supporting infrastructure such as barracks and communications facilities. Each of the three runways on these islands is about 2,700 m long, with Surface-Air Missile (SAM) systems and close-in weapons systems to defend them. Once construction ends, the three islands will be able to deploy a combined total of up to three fighter regiments in the Spratlys.³⁸ A PLAAF fighter regiment consists of three squadrons, with each squadron consisting of three flights of four aircraft each. This means it can deploy over 100 J-11 air superiority fighters in the heart of the SCS.
- Japan’s Air Self-Defence Force reported its fighters scrambled 1,168 times over the 12 months, up from 873 last year. A record 851 jets headed off approaching Chinese planes, or 280 more instances than in the corresponding period last year.³⁹
- The PLAAF recently sent out multiple aircraft formations to conduct combat exercises over the Western Pacific Ocean and the South China Sea (SCS), according to a March 25 statement by the Ministry of National Defence (MND) in Beijing. Shen Jinke was quoted as saying that multiple Chinese aircraft, which included the Xian Aircraft Corporation (XAC) H-6K strategic bomber and the Sukhoi Su-30 fighter, flew over the Miyako Strait and carried out combat training over the Western Pacific to test long-range operational capabilities⁴⁰.

37. <http://thediplomat.com/2015/11/china-stations-combat-aircraft-on-south-china-sea-island/>

38. <http://thediplomat.com/tag/china-militarization-of-spratly-islands/>

39. <https://www.reuters.com/article/us-japan-defence-scrambles/japan-scrambles-jet-fighters-at-record-pace-as-chinese-military-activity-rises-idUSKBN17F0J6>

40. <http://www.janes.com/article/78841/plaaf-conducts-combat-exercises-over-western-pacific-south-china-sea>

Clearly, China has successfully used the PLAAF for political signalling, show of military capability and intent, and as a future coercive potential in the East and South China Seas.

• *With the HQ-9 SAMs, as well as Shenyang J-11 "Flanker" and Xian JH-7 "Flounder" fighter jets, PLAAF operations on Woody Island, enable an A2/AD bubble in the SCS.*⁴¹

Clearly, China has successfully used the PLAAF for political signalling, show of military capability and intent, and as a future coercive potential in the East and South China Seas. Interestingly, Ding Laihang the current PLAAF chief, is clearly committed to furthering the strategy of his predecessors. "In the past, our strategies and guidelines focused on territorial air defence. Now we have been shifting our attention to honing our ability in terms of long-range strategic projection and long-range strike," he told China National Radio. "A strategic force must go out," he said. "We will continue to carry out long-distance training over oceans".⁴²

ASIAN WATERS: THE FUTURE BATTLEGROUND?

Being landlocked from all three sides in the north and given the regional challenges, the Indian Ocean Region (IOR) is the key to India's future growth. Geography, energy, trade, natural resources, Sea Lanes of Communication (SLOCs) and, therefore, security, underscore the strategic importance of the Indian Ocean to India. Mahan's prophetic beliefs, "Whoever dominates the Indian Ocean dominates Asia" and "the destiny of the world would be decided in these waters", have never been more relevant. Though we do not have an articulated national security strategy, the importance of the IOR is clear to our national leadership. The prime minister defined India's approach to the IOR by declaring it a 'policy priority' and the strategy of 'SAGAR' which stands for "Security and Growth for All in the Region".⁴³ Just as for India, the IOR is

41. <https://fightersweep.com/4214/chinese-fighter-jets-deployed-to-artificial-islands/>

42. http://usa.chinadaily.com.cn/china/2017-09/05/content_31577141.htm

43. <http://www.narendramodi.in/pm-modi-at-the-international-fleet-review-2016-in-visakhapatnam-andhra-pradesh-413019>

equally vital to China's growth trajectory. The real challenge in the Asian waters is dictated by China's "Malacca Dilemma"⁴⁴ as a crucial choke point through which 80 percent of its oil imports and trade passes. The possibility of interference or denial of access through this strait triggers the deepest concerns of China's energy security. Increasingly assertive Chinese behaviour in the SCS arises out of its security concerns. The presence of the South China Fleet, development of artificial island bases, increased PLAAF activity and the clearly aggressive geopolitical posturing claiming historic rights within the Nine Dash Line, are indicative of a strategy systematically working towards establishing an indomitable presence in the region.

From India's security perspective, the Malacca Strait also links the IOR to the SCS. A vital strategic assessment which emerges from it is that the Indian Ocean and South China Sea are the co-joined twins of the Asian waters, and their interdependence is an imperative in any future strategic calculus in the region. Therefore, the challenges of the SCS directly and indirectly impact the IOR. This has increasingly been evident in the recent years, with increased PLA Navy (PLAN) presence and activity, whether it is active anti-piracy missions off the Somali coast and the Gulf of Aden, expansion of Gwadar and Hambantota ports or the development of the 'String of Pearls' shipping and submarine facilities. **The IOR being the vital 'Road' of China's OBOR strategy, greater power projection will be inevitable. Presently, it is constrained in employing the PLAN effectively in the region till it achieves its long-term ambition of at least a two carrier task force.** The situation in the ECS and SCS has not constrained the PLAN from increasingly making its presence felt in the IOR.

The conflicting ownership claims amongst the island territories and the waters of the East China Sea with Japan and Taiwan, led China to declare an

44. Marc Lanteigne, "China's Maritime Security and the 'Malacca Dilemma'", *Asian Security*, vol 4, issue 2, 2008.

ADIZ in 2013 which triggered an international furore.⁴⁵ The ADIZ declaration is classic Douhet—the country controlling the air would control the surface. Given the rapidly diminished international acceptance of capturing of territory, and the revival of maritime power for control of the seas, control of the air space over the projected maritime power is the new air power paradigm. Notwithstanding the relevance of a carrier task force, the ability of land-based air assets to swiftly reach the area of interest with mid-air refuelling, undeniably brings a vital hard power capability to the table. The PLAAF's increasing capability to assert its influence over its neighbouring countries gives China an added instrument of coercion and dominance.

The current flip-flop policy shifts of the new president of the US towards countries in the region have effectively fuelled the fears of Chinese domination of the Association of Southeast Asian Nations (ASEAN). A report by the Asia Foundation⁴⁶ had cautioned that a US retreat from Asia would create a leadership vacuum and trigger massive destabilisation of the region. While China's bilateral engagements amongst the Southeast Asian countries have pushed their trade upwards, its actions in the ECS and especially the SCS have not inspired confidence amongst its neighbours, who are caught in a dilemma of choice between economic progress and national security. China has since expanded at least seven reefs and islets in the SCS, of which Subi, Fiery Cross, and Mischief in the Spratlys, and Woody Islands in the Paracel Islands have military capable airfields.⁴⁷ It will certainly commence operating from these artificial islands in the near future which will escalate the regional insecurity. Vietnam, Malaysia, Philippines and Indonesia are all upgrading their navies. The Chinese South Sea Fleet has more ships than all the SCS nations combined. The close proximity of the similarly sized East Sea Fleet doubles the threat and questions the efficacy of the regional build-

45. Mark Stokes, "China's Air Defense Identification System: The Role of PLA Air Surveillance", Project 2049 Institute.

46. Asian Views on America's Role in Asia, Asia Foundation, 2016.

47. "China's Artificial Islands Construction Activities in the South China Sea: Impact on the Southeast Asian Security Complex", http://global-initiativ.weebly.com/uploads/4/8/0/4/48042567/romero_15-16_spri2330_final_paper_china_rsct_n5.pdf

up towards a 'gray hull strategy'. Steven Stashwick argues, "The potential flashpoint maritime disputes in the South China Sea are, for now, being most actively prosecuted using a law enforcement 'white hull' strategy, begging how relevant the expanding navy 'gray hull' fleets are to solving the problem".⁴⁸ Any credible deterrence in the region, therefore, has to be bolstered with air power. Among the Southeast Asian nations, Taiwan, Indonesia, Malaysia, Philippines and Vietnam have small air forces. Most of them are a mix of aircraft of varying vintage with limited modern combat assets. Their combatworthy fighter, Airborne Early Warning and Control (AEW&C) systems and tankers are tabled below (Table 1).

Table 1: Southeast Asia's Air Forces, 1995-2015

Year	Indonesia				Malaysia			
	≤3G Fighters	≥4G Fighters	AEW&C	Tankers	≤3G Fighters	≥4G Fighters	AEW&C	Tankers
1995	50	11	0	2	74	18	0	0
2000	87	10	0	2	32	25	0	0
2005	58	14	0	2	36	23	0	4
2010	58	16	0	2	36	36	0	4
2015*	42	26	0	1	29	36	0	4
Year	Philippines				Vietnam			
	≤3G Fighters	≥4G Fighters	AEW&C	Tankers	≤3G Fighters	≥4G Fighters	AEW&C	Tankers
1995	11	0	0	0	190	0	0	0
2000	11	0	0	0	177	12	0	0
2005	11	0	0	0	193	16	0	0
2010	0	0	0	0	193	16	0	0
2015*	0	12	0	0	63	47	0	0

Key:

≤3G Fighters=third (or earlier) generation fighters; ≥4G Fighters = fourth (or later) generation fighters;

AEW&C = airborne early warning and control aircraft; Tankers= aerial refueling aircraft

Notes:

* These include the completion of currently ordered serial production by 2015 and continuation of normal retirement patterns

Sources: *The Military Balance* 1995-2014 eds.; *Jane's World Air Forces* 2005-2014

48. <https://thediplomat.com/2015/07/naval-buildups-in-the-south-china-sea/>

Table 2: Taiwanese Air Force 2012–2023

Nominal			
	2012	2018	2023
F-16	145	121	145
Mirage	57	57	57
IDF	126	126	126
F-5	60	0	0
TOTAL	388	304	328
<i>Estimated Available (Operational Rate)</i>			
	2012	2018	2023
F-16	90 (70%)	73 (70%)	96 (75%)
Mirage	42 (75%)	34 (60%)	17 (30%)
IDF	100 (80%)	100 (80%)	88 (70%)
F-5	15 (26%)	0	0
TOTAL	247	207	201

Notes: F-16 availability figures account for fighters deployed at Luke AFB for training purposes, estimated availability rates, and the estimated shortfall during the upgrade process. Mirage and IDF figures based on estimated availability rates. F-5 figures based on the end of their service life in 2018 and the fact that replacement trainers are not expected to have the same emergency combat ability. 2012 operational rates are based on testimony of the LY by a Taiwan Air Force chief of staff.

The Taiwanese Republic of China Air Force (ROCAF) currently has 145 F-16A/Bs, 57 Mirage 2000D/Es, 126 IDFs, and 60 F-5E/Fs. However, not all the aircraft are operational. Of these, 70 percent of F16s and only 26 percent of the rapidly ageing F-5s are operational. In total, out of 388 combat fighters, only 247 are operational. It also has 6 AEW and about 22 maritime reconnaissance and surveillance aircraft. The only other air force of consequence is the Republic of Singapore Air Force which is the most modern amongst the Southeast Asian Air Forces. It is equipped with 62 block 52/52+ F-16 C/D, 40 F-15SG and 27 F-5E/F fighters, all the Advanced Medium-Range, Air-to-Air Missile (AMRAAM) equipped and Air-to-Air Refuelling (AAR) capable. It has 4 Gulfstream 550 AEW&C aircraft and also has 9 KC135/130 tankers, with 6 KC 30 Airbus 330 tankers on order. Simply put, none of these nations can match up to the PLAAF individually. Yet, all of them are running programmes to

modernise their air forces having realised that the only credible conventional deterrence possible against a maritime threat is a strong air power with a modern inventory. Together, however, these air forces can certainly offset some of the asymmetry in China's favour in the contested waters of the region, especially if brought together by a common purpose and training.

AIR POWER: THE REGIONAL GAME CHANGER

The Indian Air Force, with its legacy of contribution in four wars, is a force which both its adversaries are wary of. This is because it has not only consistently proven its capabilities operationally; it has also displayed its strategic agility time and again. The airlift of 1,600 troops in the IL76 aircraft with fighter escorts, flying non-stop over 2,000 km within nine hours of the request for help to avert a coup in the Maldives in 1988,⁴⁹ is a classic example. This capability has been underscored in the Humanitarian Assistance and Disaster Relief (HADR) response, from the tsunami of 2004, Hurricane Katrina, the Malaysian floods, the earthquake in Nepal, evacuation of stranded Indians from Yemen to the extensive air rescue and relief operations in the Kashmir and Uttarakhand floods⁵⁰. The Service has an unparalleled HADR record in Asia if not the world, proving its soft power capability for all to see.

While the air force has not fought a war since Kargil, it has credibly showcased its professionalism in a large number of international exercises with the US, UK, France, Singapore, UAE and Russia. The Cope India Exercise with the US held in India in 2004 and the IAF's first ever participation in the multinational Red Flag Exercise in the US in 2008 proved the IAF's capabilities to adapt, innovate and more than hold its own against the most modern of air forces, despite technological shortcomings. About the capabilities of IAF pilots, the US Air Force (USAF) team leader of Cope India 04, Col Greg Newbech, said: "What we've seen in the last two weeks is the IAF can stand toe-to-toe with the best air force in the world. I pity the pilot who has to face the IAF and chances the day to underestimate him; because he won't

49. http://indianairforce.nic.in/show_page.php?pg_id=109

50. <http://nidm.gov.in/idmc/Proceedings/ArmedForcesNov29/1.pdf>

Pakistan has India in a bear-hug of sorts, much as we want to disengage and pull away; it serves to perpetuate the Indian threat as it enables the Pakistan military to remain the power centre. The regular Kashmir baiting, cross-border terrorism and periodical India-bashing sustains the Pakistan military's 'India's anti-Pak hegemonic agenda' narrative to its people.

be going home⁵¹". In the 2008 Red Flag, the spokesperson of the USAF, Capt Marcus Wilson, had this to say, "The IAF is a world class air force with great aircraft and great leadership. It's a great training opportunity for the USAF and IAF to integrate our assets in a training environment. We would like to have the IAF here as a regular participant".⁵² The combat skills came as a surprise to most modern air forces because till the end of the Nineties, the IAF had not participated in any international exercise. Due to its predominantly Russian inventory, it was mistakenly presumed by the West (the US and NATO), that the IAF flew outdated Russian tactics. There was also very little knowledge or awareness

about the IAF's history and capability amongst Western defence analysts, air power practitioners and its students. But having rubbed shoulders and exercised with practically all the major air forces for over a decade, it has earned the reputation of being a professional and formidable air power.

Even though the IAF is going through its lowest ever fighter squadron strength, it retains an operational edge over its adversaries individually. The real challenge, however, is a collusive Sino-Pak threat, for which our present numbers are inadequate. So how does the threat scenario pan out for India? First, let us look at the threats individually. Pakistan has India in a bear-hug of sorts, much as we want to disengage and pull away; it serves to perpetuate the Indian threat as it enables the Pakistan military to remain the power centre. The regular Kashmir baiting, cross-border terrorism and periodical India-bashing sustains the Pakistan military's 'India's anti-Pak

51. <https://theaviationist.com/2014/05/02/cope-india-2004-results/>

52. <http://www.hindustantimes.com/delhi-news/us-air-force-wants-iaf-in-red-flag-exercise/story-MvyAPbl2xLCFgmyfspky9K.html>

hegemonic agenda' narrative to its people. Given the history of four wars, all initiated by Pakistan, India does not have much choice but continue to look at its western neighbour as an immediate threat. The western border is seen as a potential nuclear conflict hotspot internationally. The Kargil War proved that conventional conflict is still possible under the nuclear umbrella, and in keeping with the recent Indian hard power response by way of surgical strikes, the Pakistan threat is alive and well. Though it has a strong and modernised air force, despite the reduced numbers, the IAF retains the advantage by way of modern platforms, weapons, force-multipliers, and net-centric operations.

China, on the other hand, is the actual long-term adversary, if not a direct threat. Till recently, India did not feature much on the Chinese strategic calculus, as its real world challenges lie on the eastern side. US support and power projection in the Southeast and East Asian regions is its bigger challenge. However, having successfully given clear indications of its rising power trajectory, the Chinese approach to India has undergone a recent hardening. It stood its ground in stonewalling India in its Nuclear Suppliers Group (NSG) entry and UN Security Council seat, and actively, as well as openly supported Pakistan on the Masood Azhar issue⁵³. It is keen to get boots on the ground along the CPEC corridor which passes through PoK⁵⁴, giving it a direct opening into the Arabian Sea – an alternate route for its trade and energy requirements which otherwise are totally dependent on the IOR-Malacca Strait route.

The Tibet Autonomous Region (TAR) and Chinese occupied Aksai Chin are vital as they link Tibet to the Xinjiang province which shares borders with Mongolia, Russia, Kazakhstan, Kirghizstan, Tajikistan, Afghanistan, Pakistan and India. This is China's gateway to the resource rich Central Asian Region.

53. <http://www.ndtv.com/india-news/no-change-in-stand-on-indias-nsg-membership-masood-azhar-says-china-1636990>

54. <http://www.ndtv.com/india-news/chinese-troops-will-be-positioned-in-pakistan-security-agencies-to-government-1286550>

According to Kevin McCauley, "The current round of ambitious PLA reforms, including creation of peace-time joint theatre commands, will significantly increase joint operations capabilities in the newly formed Western Theatre Command (WTC) with responsibility for the Indian strategic direction".⁵⁵ He analyses that the WTC contains the Combined Arms Tactical Training Bases (CATTB) located at Xichang and Qingtongxia. These are highly developed training facilities for both combined arms and joint training with the PLAAF which typically contain direction, evaluation and simulation facilities. Exercise umpires, Multiple Integrated Laser Engagement Systems (MILES), data collection systems, and Opposing Forces (OPFOR) are employed to promote training realism and evaluation. The Qingtongxia CATTB includes an urban warfare training village, electromagnetic environment simulation, monitoring and control systems, as well as a 1:500 scale (900m x 700m) mock-up of the contested Aksai Chin border region. The PLAAF experimental training base at Dingxin is used for live fire and complex electromagnetic environment training and PLAAF units rotate through this large training area. The Tibet Autonomous Region (TAR) and Chinese occupied Aksai Chin are vital as they link Tibet to the Xinjiang province which shares borders with Mongolia, Russia, Kazakhstan, Kirghizstan, Tajikistan, Afghanistan, Pakistan and India. This is China's gateway to the resource rich Central Asian Region, and geographically vital for all its economic initiatives, i.e. the Shanghai Cooperation Organisation (SCO), OBOR, and CPEC. Since China has committed and invested so much in these initiatives, it is very unlikely that it will resolve its territorial claims with India. With an evident Sun Tzu approach to its border dispute with India, the simmering threat of conflict, albeit a localised one, is very real.

And, finally, there is the collusive threat from both these nations. While Pakistan most certainly may want to have a go against India, with China actively participating with it, this is fraught with disadvantages for China for several reasons. The main reason is that China does not want to go to war with any country if it can avoid it at this point in time as it would go against

55. Kevin McCauley, "Snapshot: China's Western Theatre Command", *China Brief*, vol 17, issue 1, January 13, 2017.

its *Zhongguo heping fazhan* policy. It would lose face internationally as any military aggression would be contrary to the carefully projected perception shaping efforts of a peaceful nation regaining its long lost glory. It would force the world to take sides, a situation it does not want to risk as yet. The Doklam incident, if anything, indicates that while it may have wanted to test the waters of military coercion against neighbouring Bhutan, a firm and resolute response by India, elicited face saving disengagement for the time being.⁵⁶ Next is that despite its military modernisation, and changes in its national security policies, it hasn't fought a full-fledged war in a long time. While it has started exposing its forces to training opportunities outside, its military's modern war-fighting model is still largely rooted in the concepts of the Soviet era. However, active training and exercising between the PLAAF and Pakistan Air Force (PAF) are efforts at closing the gap.⁵⁷ Over the last two decades, the People's Republic of China (PRC) has embarked on a series of transformations from a massive low tech force to a leaner and modern high tech one, capable of power projection and influence,⁵⁸ adapted on Western precepts—primarily the US. Being a long way off from achieving its desired capabilities and capacities, the Chinese military is still 'crossing the river carefully, feeling the stones'. And, finally, any major military confrontation with India would force it to open another front. Since thinning its vital west coast is not an option, an additional front would most certainly tie down the PLAAF, forcing it to spread thin its quality resources. The IAF, on the other hand, even with its present capabilities, can still prevail in air operations to shape the outcome of any localised surface conflict.

INCREASED ROLES, MISSIONS AND TASKS

The true capabilities of air power in the Indian context have not yet been realised. The IAF has been recognised as a significant contributor in wars, it is the keeper of India's 24x7 air defence, it plays a vital role in peace-

56. <https://thediplomat.com/2017/10/the-doklam-standoff-between-india-and-china-is-far-from-over/>

57. <https://www.orfonline.org/expert-speak/closing-gap-doctrinal-capability-appraisal-iaf-plaaf/>

58. Burke, et al., n. 19.

time logistic support to the Indian Army and it has been outstanding in HADR. Has India leveraged the strategic capabilities of this Service in serving our national interests? Not as much as it could have, and, more importantly, not as much as it can and should. According to Ashley Tellis, the "period between now and 2025 is one of strategic vulnerability for India".⁵⁹ Arguably, this is also the period when China has involved itself on many fronts geopolitically. With its economy slowing down, unabated energy hunger, military modernisation and the ambitious OBOR initiative, it is unlikely to get embroiled in any direct military confrontation. Recent Indian foreign policy actions, especially in East and Southeast Asia, have certainly affected the Chinese strategic calculus. This presents India with a unique window to counter-balance some of the maritime initiatives by China in the Indian Ocean. China being tied down in the ECS and SCS where it is rapidly establishing its presence provides a window for India to accelerate its maritime strategy, with an air strategy strengthening it. It is time for India to firmly establish its credentials as a regional power and secure its rightful national interests while enabling security and growth for other Asian countries in the region. It is time for some 'Kautilya' to checkmate 'Sun Tzu'! Kautilya's 'Circle of States' foreign policy provides the apt counter-strategy for India to establish its credentials as a regional stabiliser and security provider.

The enemy, however strong he may be, becomes vulnerable to harassment and destruction when he is squeezed between the conqueror and his allies.

6.2.40 Kautilya,⁶⁰ *The Arthashastra*

Replacing 'harassment and destruction' with 'show of intent and reach' will countervail the beginnings of Chinese domination in the Asian waters, thus, providing the other countries or 'allies' in the region a stabilising alternative. This is where Indian air power can be a game changer. The IAF

59. Ashley J. Tellis and Travis Tanner, "China's Military Challenge", *Strategic Asia 2012-13*.

60. Kautilya, *The Arthashastra*, L N Rangarajan (New Delhi: Penguin, 1992).

with its present and interim capabilities, presents an opportunity for our national strategy to be bolstered and made robust, with integration of air power as a dynamic tool of national interests. How can this be achieved? Some possible ways ahead are as follows:

- Expand IAF operations and presence over our island territories – Andaman and Nicobar in the east, and Lakshadweep Island territories in the west. The SU 30 fighters, tanker aircraft and AWACS, in combination with the Indian Navy's P-8i maritime aircraft, give India a significant and credible air power presence in the entire IOR which should be pursued till it becomes the new normal.
- Enhance IAF roles and missions integrated with the Indian Navy to enable air power to reinforce maritime power e.g. air policing, ADIZ enforcement in selected areas, show of reach and response over PLAN presence in the Indian Ocean Region (IOR), joint international air force maritime exercises, Search and Rescue (SAR), anti-piracy missions—the list is only limited by vision. Unfortunately, all maritime strategic thought tends to ignore the tremendous capability that land-based air power brings to the table. Going with the prime minister's SAGAR strategy, the IAF can play a significant role in maintaining security and safeguarding India's national interests in the IOR. While the PLAN carries out extensive patrolling in the IOR, it is not supported by its air power. The IAF, with its long range fighters, AWACS and tankers can send strong signals of capability. Imagine, IAF aircraft flying past PLAN ships, exercising with the Indian Navy or other friendly navies, deep in the IOR or along our vital SLOCs. While these do not have to become regular missions, undertaking them periodically will in itself send strong strategic signals.
- Building air force-to-air force relationships by exercising and operating with countries on both the east and west, would enable Indian air power the additional reach and access to support the nation's objectives. Unlike the erstwhile US' strategy⁶¹ and of late, China's,⁶² air power does

61 Michael W. Pietrucha, "Making Places, Not Bases a Reality", March 28, 2016.

62. Daniel J. Kostecka *Places and Bases, The Chinese Navy's Emerging Support Network in the Indian Ocean* (February 16, 2016).

not need to create 'bases', only access to 'places' in friendly countries. With its vast experience in long range international deployments, the IAF's professional goodwill, HADR image and strategic reach should be exploited. Greater interaction with the regional air forces—Bangladesh, Sri Lanka, Vietnam, Malaysia, Singapore, Thailand, Indonesia, Philippines, Japan, South Korea and Australia needs to be encouraged. Interestingly, India has defence agreements with all these nations, including Brunei, Cambodia and Laos⁶³. While we have some level of interaction with Sri Lanka, Singapore, Malaysia, Indonesia and Vietnam, building security partnerships, if not relationships, by way of undertaking a wide range of interoperability and HADR exercises, military support and training exchanges, and goodwill actions with these air forces, is an unrealised strategic potential.

- Similarly, in the west, with Oman, UAE, Kenya and Tanzania, India already has good relations. Oman, especially, has been a historical pivot of the Arab trade links with 'Al Hind' or India⁶⁴. The IAF conducts air exercises with the UAE and Oman; it needs to build on this further. Building relations with Tanzania and Kenya—both nations with small air forces⁶⁵—by providing training and military support gives Indian air power access to the western edge of the IOR.
- The India supported air base in Tajikistan⁶⁶ must be utilised for expanding air power presence in the heart of the continental Asian region. The strategic significance of the base is enormous as it enables Indian power projection in the Central Asian Region (CAR) and also provides a strategic pincer to the Kashgar region and PoK. It also provides India the unique option to use air power for economic support, security and stability in the Afghanistan region.
- Enhanced air power presence during border violations, especially in the Ladakh and Arunachal sectors, with IAF fighters operating in own

63. MEA Annual Report, 2015-16.

64. Robert D. Kaplan, *Monsoon* (Random House, 2011), pp. 22-23.

65. Brahmand, *World Defence Update 2017* (Pentagon Press, 2017).

66. <http://defencenews.in/article/Tajik-Prez-visits-India,-Ayni-Airbase-may-be-leased-by-India-for-Military-Ops-159594>

territory close to the LoC, would send strong strategic signals that our surface forces have active air cover.

CONCLUSION

India today is at the cusp of economic growth, expanding its presence as a stable and strong nation, regionally and internationally. Its future growth depends significantly on peace and stability in the region. From a security perspective, its future trajectory is impacted by its two adversaries, both nuclear powers, which share extremely close relations with each other. India is landlocked to the west and north, denying it crucial energy and economic access to West and Central Asia. The security challenge of long land borders, with large tracts being disputed, effectively ties down India's land forces. The IOR is, therefore, its major lifeline for trade and commerce, and having recognised this, the Indian government has clearly articulated a maritime strategy. The strategy is important for our growth and, therefore, must be strengthened by exploiting air power as it brings a lot to the table, especially in the Indian context. Even with its present holdings, the IAF can contribute significantly towards stabilising the region with an increased 'aerial presence'. China has expanded its maritime envelope to support its strategic security and economic interests. With its Malacca dilemma and the geographical linking of the SCS with the IOR, China's maritime interests will increasingly clash with India's. While India is not in any sort of competition, both Asian giants, with their historical legacies, will inevitably be compared. With the recent Chinese hegemonic actions and stands, India must not lose the window of opportunity to project itself as the stabilising power – and air power is ideally suited to help realise this.

The IAF is an experienced, capable, credible and a mature force. Even in its present state of reduced numbers, the Service still has a vast array of soft and hard power capabilities with which it can contribute significantly towards India's present and future geopolitical trajectory. Indian air power provides that vital strategic asymmetry and agility that can offset the evident and ever increasing Chinese influence in the region. Since it is the only Asian

air force with the capability and reach across the entire IOR, increasing aerial presence will definitely fill the strategic spaces and influence. A structured and graduated approach of expanding the IAF's roles, missions and tasks, apace with its progress to a 45 combat squadron force, could significantly contribute towards peace, growth and stability in the region. This will also enhance India's regional and international credibility, moving it closer towards a deserved great power status.

CSFO LESSONS FROM THE INDIAN WARS

JPS BAINS

The raison d'être, the reason for its (the air force's) very existence, is to try and neutralise the enemy's various war potentials in wartime, by every possible means and to protect one's own.

—Air Chief Marshal PC Lal¹

INTRODUCTION

Counter-Surface Force Operations (CSFOs) or operations in support of surface forces, comprise a fundamental and inalienable facet of air power application, which has been conducted by virtually all significant air forces since World War I. These operations have similarly been conducted by the Indian Air Force (IAF) in all its major wars/conflicts with Pakistan. Refusal to use this vital combat component of the IAF in the 1962 Sino-Indian War was a major contributing factor which led to an eventual debacle. On the contrary, innovative application of air power during the Kargil conflict of 1999 was a key enabler of IAF operations which significantly contributed to the eventual success. Likewise, internationally, innovative applications during the Gulf Wars and Arab-Israel conflicts have played key roles in contributing to the success of these wars and campaigns. All these illustrate

Group Captain **JPS Bains** is a serving IAF officer from the fighter stream. He has extensive operational experience on varied aircraft and has participated in Operation Safed Sagar.

1. *Basic Doctrine of the Indian Air Force* (2012), Air HQ, New Delhi, p. 25.

Concrete data on the conduct of past conflicts is scarce and incomprehensive. Analysis of the IAF's performance, as recounted in various books, is coloured more by personal perspectives and perception and not fully correlated by verifiable facts and figures.

the fundamental primacy of this facet of air power.

The role of the Indian Air Force during the Indian wars is not very exhaustively documented or very objectively written and is available only in limited forms. The official history of the 1947-48 conflict and the Indo-Pak Wars of 1965 and 1971, written after a lapse of many years, was released in 1992 under "Restricted" classification. Concrete data on the conduct of past conflicts is scarce and incomprehensive. Analysis of the IAF's performance, as recounted in various books, is coloured more by personal perspectives

and perception and not fully correlated by verifiable facts and figures. This is seen to occur even more so in the case of recounts of CSFO conducted by the IAF, owing to differing perspectives and expectations of combatants from two different Services. Consequently, the personal accounts of the different authors from the two Services depict the IAF's performance as exceptional, on one extreme, to negligible, on the other. The official accounts tend to follow a moderate line and shy away in acknowledging the good work of the IAF to the required degree, as well as in expressing criticism of the IAF's mistakes.

Consequently, it becomes an important endeavour to be objective in analysing the Indian wars in order to derive tangible conclusions and lessons from these wars. The noteworthy wars from where important CSFO lessons can be drawn are the 1962 War with China, the 1965 and 1971 Wars with Pakistan and the Kargil conflict with Pakistan in 1999. Of these, the 1962 India-China War and the 1999 Kargil conflict were not conventional, but limited wars.² In this paper, all these wars/ conflicts are endeavoured to be objectively examined in that context, to bring out observations and

2. R Sukumaran, "The 1962 India-China War and Kargil 1999: Restrictions on the Use of Air Power", *Strategic Analysis*, vol. 27, no. 3, July-September 2003.

derive lessons which could be of relevance to the present. Lessons from the Kargil conflict are derived from personal experience and perception from active participation.

1962 WAR WITH CHINA

Narrative

In this war, it was a political decision to not use the IAF in the offensive role. The IAF was restricted to a combat support role. The reasons for the same were many. Firstly, the higher defence decision-making authorities of that time never expected the Chinese to fight and, secondly, they feared a backlash by Chinese bombers on major Indian cities, especially in north India, much in the mould of World War II city bombardments and the IAF had inadequate Air Defence (AD) to counter the same. The higher defence decision-making body was very much civilian oriented, externally influenced and coterie dominated, with very little IAF involvement. This was supplemented by superficial, shallow and rumour driven intelligence assessments picked up from the border areas and provided by the Intelligence Bureau, both during the build-up phase and during the war. The Defence Intelligence Agency used the same inputs in formulating their opinions rather than rely on assessments by the relevant commands.³ An additional deterrence was provided by the US Ambassador to India, Mr Galbraith, who overestimated offensive Chinese Air Force capabilities based on the Korean War experience and strongly advised against the use of offensive air action for fear of Chinese retaliation.

Consequently, it led to an incorrect appreciation of the threat build-up, Chinese intentions and on employment of the IAF, in the minds of the

It was a political call based on shallow intelligence and political perceptions rather than a professional appreciation from the IAF leadership, which resulted in the grave misjudgement of not using the IAF in the offensive air support role.

3. Kapil Kak, "Higher Defence Management: Lessons from the 1962 Conflict" *CLAWS Journal* Summer 2013.

political leadership and higher defence decision-making authorities. The leadership did not expect a war and was simply not prepared for one. When it eventually occurred, it was a political call based on shallow intelligence and political perceptions rather than a professional appreciation from the IAF leadership, which resulted in the grave misjudgement of not using the IAF in the offensive air support role. A conciliatory tactical, non-escalatory support role, as advised by British advisor Professor PMS Blackett, was eventually adopted by the government.⁴

The question that arises is that if offensive action was not undertaken, then what could be the CSFO lessons that could be derived from this non-action? The argument that is presented is that this non-action in itself is the biggest lesson of the war and an even bigger advocate of the crucial necessity of employing air power in an offensive role in support of the ground war. There is a line of thinking which argues that the IAF would not have been effective, and a different line of thinking which brings out the factors that would have contributed to the success of the IAF in the case of its employment in the offensive role. Both arguments need to be examined as they form the basis of deriving crucial lessons on CSFO employment efficacy during this war.

Arguments Against: The following arguments are presented to contest the efficacy of the offensive role of the IAF during the war:

- Hill flying at that time was restricted as the primary threat was from Pakistan in the plains. Neither the government nor the IAF expected to fight the Chinese in the mountains.
- No one had ever tried out bombing, rocket or front gun attacks in the hills/mountains. No Standard Operating Procedures (SOPs) existed about heights to fly, dive angles, weapon release heights, escape routes, weather impact during post-noon operations, range/endurance of aircraft versus weapon load carriage, search/rescue, helicopter support, etc.
- The type of training required for quality CSFO in the mountains had not been undertaken previously.

4. Ibid.

- Quality cooperation with the army for operations (especially in the hills) was non-existent. The plans and priorities were separate. Tactical Air Centres (TACs) and other joint mechanisms or organisations, were either not effective or not created, but certainly not exercised.
- By October 1962, no jet-engined fighter aircraft had landed either in Srinagar or Leh.⁵
- There were no Forward Air Controllers (FACs) trained in the mountains.
- During most of the war, most of the army formations were in retreat, front lines were unknown and maps were poor.

Arguments For: The following arguments portray the rationale for a probable success of the IAF in the case of use in the offensive role:

- Offensive air action was never sought by the government. It never expected the Chinese to launch an offensive. The developments and skirmishes were very localised and assessed to be handled locally by the army units. This line of thinking was prevalent from the beginning and the IAF was not required. In case of a requirement, the IAF would have trained, adapted and evolved in the roles sought. **It is in the very inherent nature of air power to adapt and evolve.** The same was seen in the air transport role during the same war, where aircraft were exploited, at times beyond their laid down capabilities.
- The IAF's airfields were at sea level and did not suffer from any performance penalty on its aircraft. On the other hand, operations from the higher Tibetan airfields would have severely curtailed both the radius of action and the operational loads that Chinese aircraft could have carried. In any case, these airfields had not been prepared for operations. Consequently, there was limited scope for Chinese offensive air action in the Tactical Battle Area (TBA).
- The unopposed low level reconnaissance sorties carried out by IAF Canberra aircraft over the TBA pointed to a lack of Chinese Air Defence (AD) to hinder own aircraft operations in the TBA.

5. AG Bewoor, (July 2009). "Close Air Support in the 1962 War". Accessed from <http://www.bharat-rakshak.com/IAF/history/1962war/1019-bewoor.html>.

- Chinese supply lines were stretched and were vulnerable to air attack. This aspect was brought out by the Canberra reconnaissance sorties, but not used, as a decision to the contrary had already been reached. On the other hand, the Indian supply dumps in the plains were well out of Chinese reach.
- The Chinese Air Force was further degraded due to the withdrawal of Soviet support and deployment on the eastern front to cover the Taiwanese threat and could not have committed adequately.⁶

Inferences and Lessons

The arguments bring out that the Chinese threat was not as much as it was feared and an offensive air action then would have exposed these vulnerabilities. In all the Chinese writings about their preparations, there is no word about the role of the People's Liberation Army Air Force (PLAAF) or its preparations. This is not surprising considering the generally undeveloped nature of the airfields in Tibet and the limited offensive capability of their aircraft. This implied that the attainment of the prerequisite and important tenet of control of air was very much possible by the IAF, which would have enabled a successful offensive air action.

Pertaining to preparations and targeting, it can be safely assumed that if it was politically indicated, then the IAF would have adapted to the requirements, as was done in the case of transport aircraft utilisation during the same war and as was seen later during the Kargil conflict. The situation is in many ways similar to the Kargil conflict, where limited prior training for high altitude operations had been carried out; but once launched, the IAF adapted to the situation. Offensive air action by the IAF would definitely have affected the course of the battle, especially as the meagre AD resources available with the Chinese at that time would have given the IAF the luxury of time and space to adapt. Within such operations, while Battlefield Air Strike (BAS) missions would not have been very effective, air interdiction

6. AK Tiwary, *Indian Air Force in Wars* (New Delhi: Lancer Publishers, 2010), pp. 87-93.

and Battlefield Air Interdiction (BAI) missions would certainly have been the game changers.⁷

Lessons: The lessons that can be derived from this conflict are the following:

- The CSFO role of the air force is vital towards ensuring the success of a ground battle.
- There is a requirement of a focussed methodology and continuity in training towards hill flying and air-to-ground targeting in high altitude/mountainous regions.
- Importance of arriving at decision-making through appreciation tools rather than perceptions.
- Importance of timely and correct intelligence towards conduct of operations and decision-making. Inferences and assessments need to be arrived at after correlating factors holistically, and not at face value; else, it would only be information and not intelligence.
- Joint mechanisms and organisations need to be set up, from the strategic to the tactical levels and such mechanisms exercised regularly towards planning and conduct of air land battles.
- Requirement of adequate preparations and planning during peace.
- BAI and air interdiction missions are likely to be more effective than BAS in mountainous terrain.
- Greater inter-Service knowledge of capabilities is required, especially in areas involving joint battles.
- Limitations of aircraft operations from higher altitudes and payload restrictions need to be well understood and planned for accordingly.

7. BAS in the mountains are generally more challenging than in the plains due to the requirement to manoeuvre fighter aircraft in tight valleys against an enemy advancing along slopes of mountains. Spotting troops from standoff distances is a challenge for a fighter pilot flying at speeds of 200-250 m/sec. Interdiction of supply lines, on the other hand, pose a lesser challenge for fighter aircraft as these are mostly static targets (bridges, roads, supply dumps, etc.) against which attacks can be carried out after due planning. Large convoys of vehicles can be easily spotted and attacked from the air successfully.

Numerically, the IAF had a superiority of 1.4:1 aircraft against the PAF in the western theatre and 11:1 aircraft in the east, but was against a highly trained PAF, equipped with aircraft and weapon systems sourced from the USA, which were technologically superior to those of the IAF.

INDO-PAK WAR OF 1965

Narrative

The Indo-Pakistan War of 1965 saw the IAF and Pakistan Air Force (PAF) engage in large-scale aerial combat against each other for the first time since independence in 1947. This was the first occasion when the full ambit of IAF capability was operationally tested. The war began in early August 1965 and the fighting was initially confined mainly to the ground forces. The aerial phase of the war began on September 1, 1965, when the IAF responded to an urgent call for air strikes against the Pakistan Army which had launched an attack known as Operation Grand Slam. The full scale aerial phase of the war began on September 6, when the PAF launched a preemptive attack against four IAF air bases and three radar stations in the west.⁸

Numerically, the IAF had a superiority of 1.4:1 aircraft against the PAF in the western theatre and 11:1 aircraft in the east, but was against a highly trained PAF, equipped with aircraft and weapon systems sourced from the USA, which were technologically superior to those of the IAF. The war lessened in intensity after September 8, 1965, with occasional clashes between the IAF and PAF. Both air forces changed their doctrine from air interdiction to ground attack, and concentrated their efforts on knocking out soft skin targets and supply lines, such as vehicles carrying ammunition, armoured vehicles, etc. The ceasefire was declared on the night of September 22, 1965. Pakistan claimed to have destroyed 104 aircraft against its own losses of 19, while India claimed to have destroyed 73 enemy aircraft and lost 35 of its own. Despite the intense fighting, the conflict was effectively a stalemate.

8. AK Tiwary, "IAF Defeated PAF in 1965 War", *Indian Defence Review*, vol 22, no. 1, January-March 2007. Accessed from <http://www.Indiandefencereview.com/spotlights/iaf-defeated-paf-in-1965-war>.

Inferences and Lessons

The CSFO lessons and inferences from this war are enumerated below:

- There were doctrinal differences between the army and IAF due to which expectations varied.
- The organisational structure, mechanisms, SOPs and infrastructure for close air support were not established. The system of seeking air support was ineffective. The PAF was better informed on targets in the tactical battle areas.
- The PAF seemed to have better intelligence of our deployments, and redeployments. In our case, lack of accurate intelligence entailed flying that many more sorties for similar effect.⁹
- There was little jointmanship on display and no clear-cut concept of operations. Time and again, pertinent information was not passed to the IAF or the IAF Commands were kept in the dark about the army's plans.
- The close air support mission demands were more in the nature of ad hoc search and strike missions in deeper areas. Targets would be changed frequently during the course of planning. Many strikes got aborted due to lack of targets. As a result, the conduct of operations was less than optimum.¹⁰
- Our intelligence was sorely inadequate, and without effective and usable intelligence, we could, at best, only react to enemy actions, and were often surprised.

There was little jointmanship on display and no clear-cut concept of operations. Time and again, pertinent information was not passed to the IAF or the IAF Commands were kept in the dark about the army's plans.

9. PVS Jagan Mohan, Samir Chopra. (2005). *The India-Pakistan Air War of 1965*, book review accessed from <http://www.ipcs.org/books-review/indo-pak/the-india-pakistan-air-war-of-1965-214.html>.

10. Tiwary, n.6, pp. 129-139.

INDO-PAK WAR OF 1971

Narrative

A full-scale aerial war began on December 3, 1971, when preemptive strikes were launched by the PAF against the IAF bases at Srinagar, Amritsar, Pathankot, Ambala, Agra, Jodhpur, Uttarlai, Awantipur, Halwara and Sirsa. Apart from the IAF bases, the PAF attacked railway stations, armour concentrations and other targets. The IAF went into action the same night and continued operations at an unprecedented pace of 500 sorties per day. During the ensuing two weeks, the IAF carried out around 4,000 sorties in the west from bases in Jammu and Kashmir (J&K), Punjab and Rajasthan, while, in the east, a further 1,978 sorties were flown. Throughout the conflict, the Indian strategy was to maintain defensive postures on the western and northern fronts whilst placing emphasis on a lightning campaign in the east. Unlike in 1965, the overall objectives had been clearly stated: to gain and maintain a favourable air situation over the tactical area and support the army in the field. To be able to do this, mount reconnaissance, interdiction and other operations having a direct bearing on the outcome of the land battle.¹¹

Mission emphasis on the eastern front was on gaining control of the air followed by interdiction, isolation of the battlefield and prevention of movement along the Buriganga river bank of Dhaka. The ground war and air war commenced simultaneously and did not wait for the IAF to first achieve control of the air. Once the IAF attained command of the air in the first two days, it released additional squadrons, from both the air defence and counter-air roles, in support of the army. Thus, 60 per cent of the air effort was allotted for support of the army. In the west, the IAF's primary tasks were disruption of enemy communications, destruction of fuel and ammunition reserves and enemy ground force concentrations.

The IAF had good reason for satisfaction with its showing during the December 1971 conflict. Although Pakistan had initiated the war with pre-

11. Official IAF website, "1971 Ops: The War of December 1971". Accessed at http://indianairforce.nic.in/show_page.php?pg_id=71.

emptive air strikes against major forward air bases, the IAF rapidly gained the initiative and thereafter dominated the skies over both fronts.¹² Close support missions made a significant contribution to the land battles. While success was achieved, there was a large number of losses to ground fire. As per an extract of PAF history, the areas in which the IAF performed relatively well were ground support to its army and attacks on Pakistan's lines of communications.

Inferences and Lessons

The CSFO lessons and inferences from this war are given below:

- The overall objectives were clearly stated. A clear objective must exist and all the three Services, jointly or independently, must be allowed full freedom to work towards the objective.
- The success of surface operations is directly proportional to the degree of control over the air.
- Close support missions made a significant contribution to the land battles.
- Losses of aircraft to ground fire were excessively high and needed more application and better tactics by the IAF.
- The roles of aircraft are interchangeable as per the course of the battle and capability of the aircraft.
- Weapon to target matching should be done by higher formations and not be left to the unit commanders or base commanders.
- Intelligence inputs were inadequate in many cases, resulting in inefficacy of certain missions flown. There was no concept of battle damage assessment to assess mission efficacy and future planning.
- A lead preparatory time enables better functioning of the joint organisations and mechanisms and in the preparations and conduct of the air-land battle.

12. Tiwary, n. 6, pp. 214-245.

In the context of the war and in the light of the poor information available on the infiltrations, the IAF was able to coordinate well with the army and provide air support for the recapture of most of the posts before Pakistan decided to withdraw its remaining troops.

1999 KARGIL CONFLICT

Narrative

The Kargil conflict took place from May-July 1999 to flush out regular and irregular troops of the Pakistan Army from vacated Indian positions in the Kargil sector of J&K along the Line of Control (LoC). The IAF was first approached to provide air support on May 11, with the use of helicopters. On May 25, the Cabinet Committee on Security authorised the IAF to mount attacks on the infiltrators, without crossing the LoC. This was cleared for the attack helicopters initially and further for the fighter aircraft the next day. It was the first large scale use of air power by the IAF since the Indo-Pakistan War of 1971 and was mostly aimed at providing close air support to the Indian Army in the mountainous terrain.

Air casualties were suffered on May 26, 1999, when a MiG-21 was shot down by the Pakistan Army over the Batalik sector, while a MiG-27 crashed due to engine flame-out. The following day, a Mi-17 was lost when it was hit by three Stinger missiles while on an offensive sortie. These losses forced the IAF to reassess its strategy. The helicopters were immediately withdrawn from offensive roles. On May 30, the IAF called into operation the M-2000 aircraft, which over three days, struck infiltrator positions in Muntho Dhalo, Tiger Hill and Point 4388 in the Dras sector. Strikes on Muntho Dhalo on June 17, destroyed logistics and resupply capabilities of the infiltrators in the Batalik sector. Through the latter half of June, the Mirages, armed with Laser Guided Bombs (LGBs) as well as conventional bombs, repeatedly struck the heavily defended Tiger Hill. The IAF aircraft operated at 10,000 m, well out of range of the Man-Portable Air Defence Systems (MANPADs). This, however, led to a drop in the accuracy of the bombs.

By July, all the remaining intruders withdrew and the operation ended. It is viewed as a success by the IAF in having achieved its primary objectives. However, there has also been criticism of the type of aircraft utilised, which were unsuitable to the terrain and which led to the need for the IAF to upgrade its inventory (by introducing the Mirage-2000 aircraft) and review its operational procedures and training methodologies, especially in the mountainous terrain. However, in the context of the war and in the light of the poor information available on the infiltrations, the IAF was able to coordinate well with the army and provide air support for the recapture of most of the posts before Pakistan decided to withdraw its remaining troops.¹³

The Indian Army initially requested only for attack helicopter effort against some known enemy positions. This would have been disastrous. The choice of operational methodologies is best left to the specialists.

Inferences and Lessons

The CSFO lessons and inferences from this war are given below:

- The IAF fought in an 'unconventional' manner in terms of political constraints, stringent Rules of Engagement (ROE) and terrain imperatives that had never been encountered before.
- There were issues of targeting in the mountains and lack of training.
- The air campaign was initially sub-optimal, essentially because conventional Close Air Support (CAS) was attempted in unsuitable terrain. The aircraft used did not have modern weapon delivery systems.
- All tactics prior to the operations were primed for aerial warfare in the plains on the western front.
- The IAF undertook operations without useful intelligence as it was forced into conflict in an urgent manner, dictated by the army's requests. This was subsequently built up during the course of the battle by integrating

13. "Operation Safed Sagar", September 11, 2015. Accessed at https://en.wikipedia.org/wiki/Operation_Safed_Sagar.

information from dedicated sensors as well as from inputs from the strike aircraft.

- The IAF was able to innovate and evolve effectively, primarily due to a lack of enemy air opposition.¹⁴ In case of a regular war, such operations and evolutions may not have taken place.
- The Indian Army initially requested only for attack helicopter effort against some known enemy positions. This would have been disastrous. The choice of operational methodologies is best left to the specialists.
- Use of air power with precision attack capabilities to provide battlefield air support in mountainous terrain is the decisive factor in such warfare.¹⁵

CONSOLIDATED LESSONS FROM INDIAN WARS

The consolidated lessons from the Indian wars are given below. These are lessons from the past and do not reflect, in any manner, on the current state of operations conducted by the IAF.

- The CSFO role of the air force is vital towards ensuring the success of a ground battle.
- There is a requirement of a focussed methodology and continuity towards hill flying and air-to-ground targeting in high altitude/ mountainous regions.
- Importance of arriving at decision-making through appreciation tools rather than perceptions.
- Importance of timely and correct intelligence towards conduct of operations and decision-making. Inferences and assessments need to be arrived at after correlating all the factors and not at face value, else it would only be information and not intelligence.

14. Whatever air opposition was noticed from the other side of the LoC was effectively 'chased away' by the air superiority fighters of the IAF, armed with Beyond Visual Range (BVR) air-to-air missiles, something that the PAF lacked in 1999. This deficiency has since been made up by Pakistan for its PAF.

15. R. Sukumaran, "The 1962 India-China War and Kargil 1999: Restrictions on the Use of Air Power", *Strategic Analysis*, vol. 27, no. 3, July-September 2003.

- Joint mechanisms and organisations need to be set up from the strategic to the tactical levels, and mechanisms exercised regularly towards the planning and conduct of air-land battles.
- Requirement of adequate preparations and planning during peace.
- There is a greater efficacy of BAI and air interdiction missions in mountainous terrain battles than of BAS missions.
- Greater inter-Service knowledge of capabilities is required, especially in areas involving joint battles.
- Limitations of aircraft operations from higher altitudes and payload restrictions need to be well understood and planned accordingly.
- There were doctrinal differences between the army and the IAF, due to which expectations varied.
- Organisational structure, mechanisms, SOPs and infrastructure for CAS were not established. The system of seeking air support was ineffective.
- There was little jointmanship on display and no clear-cut concept of operations. Time and again, pertinent information was not passed to the IAF or the IAF was kept in the dark about army's plans.
- The close air support mission demands were more in the nature of ad hoc search and strike missions in deeper areas. Targets would be changed frequently during the course of the planning. Lots of strikes got aborted due to lack of targets. As a result, the conduct of operations was less than optimum.
- A clear objective must exist and all the three Services, jointly and independently, must be allowed full freedom to work towards the objective.
- The success of surface operations is directly proportional to the degree of control of the air.
- Close support missions made a significant contribution to the land battles.
- Losses of aircraft to ground fire was excessively high and needed more application and better tactics.
- The roles of aircraft are interchangeable as per the course of the battle and capability of the aircraft.

- Weapon to target matching should be done at the higher formations.
- There was no concept of battle damage assessment to assess mission efficacy and future planning.
- The IAF undertook operations without proper intelligence. This was subsequently built up during the course of the war/conflict by integrating information from dedicated sensors as well as inputs from the strike aircraft.
- Use of air power with precision attack capabilities to provide battlefield air support in mountainous terrain is the decisive factor in such warfare.
- Towards capability build-up which involves larger gestation periods, the results and effects are not immediately visible. But these are foundational steps for the sustained growth of IAF capability to remain relevant and **must always be pursued relentlessly.**
- Dedicated structures do not exist in the Indian context for functions like air space management, intelligence and movement, with most issues sought to be handled either through the Joint Operational Command (JOC) or on a case by case basis. All these are very important requirements to prevent both ground and air fratricide. These are, however, laid down in other doctrines (especially by the US Air Force), where the structures, planning and execution specifics are covered in detail.
- The biggest drawback is the lack of a joint methodology towards conduct of CSFO operations. The present structure of Tactical Air Centre (TAC), Ground Liaison Officer (GLO), Advanced HQ and attempts of synergising air operations rather than conceptualising and actualising a joint integrated plan, severely undermines and sub-optimises the evolving capability of air power. The **potential of the IAF would be realised only when it assumes the lead role of 'shaper of the battlefield'** and is not confined to only providing support to surface forces. The need, therefore, is to have **a single front strategy evolved at the Service HQ level, to leverage relative Service capabilities** and define resultant objectives and roles for each of the Services at the planning level and reshaping of joint structures to ensure execution of these integrated plans.

- As an alternative step towards formulation of JOCs, certain appointments from individual Service Commands could be given additional responsibilities in spheres pertaining to planning, conduct of operations, strategic thinking and procurements, which could be running concurrently with individual Service functioning. These designations could transform to joint task forces during war and during exercises.

CONCLUSION

Considerable changes are taking place in the global and regional scenarios and in our neighbourhood. India's security environment is an amalgam of its history, geography, culture, politics, etc. The security challenges facing India are varied, complex and dynamic. For India, national security is an essential adjunct of overall national growth and development. The IAF needs to develop a capability to be able to tackle the full spectrum of threats, as envisaged in the future. The changing threat perception and military landscape of the future would require a certain degree of adaptability for the IAF to optimise in the expected threat scenario.

AIR SPACE CONTROL: CHALLENGES AND WAY AHEAD

ANIL CHOPRA

Air Space Control (ASC) refers to regulating the use of air space by multiple users. The need for regulation arises because of the finite resource of 'air space'. From the military operations' point of view, the objective of air space control is to maximise the effectiveness of combat operations without adding undue restrictions, and with minimal adverse impact on the capabilities of any component. The emphasis is on close coordination that must exist among air space control, air traffic control, and area air defence units to reduce the risk of fratricide and balance those risks with the requirements for an effective air defence. The balance required between restrictions on ASC and flexibility has to be jointly determined and evolved. The ASC plan specifies air space control procedures, joint Services procedures for integrating weapons, and other air defence actions within the operations area. The geographic arrangement of air defence weapons within the battle space and procedures for identification and engagement are integrated into the ASC plan.

During conflict, the air activity in the Tactical Battle Area (TBA) is extremely dense. Both friendly and enemy aircraft are transiting. The horizontal and vertical air space is not only fully covered but the variations

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The Indian Air Force (IAF) played a significant role in saving the Kashmir Valley in 1948, and in the victory in the 1965, 1971 and Kargil Indo-Pak Wars.

in time and space are dynamic. Most flights are launched at very short notice, based on the evolving tactical situation. There are fast moving jets, slow moving helicopters and many Uninhabited Aerial Systems (UAS). Also occupying the air space are high velocity long and medium range artillery shells and a variety of missiles. Ground-based air defence weapons are on hot standby, and some are operated from remote locations close to the Forward Edge of the Battle Area (FEBA). Military operations will get priority but the civil air operations could be allowed to continue albeit with small restrictions and regulations in time and space. There is, therefore, a need for quick timely information sharing. There have to be clearly designated agencies for direct and procedural control.

AIR DIMENSION EVOLVES

Intercontinental operations became possible in World War II because of the maturing of air power which, in a great way, decided the outcome of the six-year war. More recently, the Arab-Israeli Wars of 1967 and 1973, Bekaa Valley operations, the Falkland War, the Bosnian conflict and the post 1990s wars in West Asia, Afghanistan and Libya have been predominantly air wars. Closer home, the Indian Air Force (IAF) played a significant role in saving the Kashmir Valley in 1948, and in the victory in the 1965, 1971 and Kargil Indo-Pak Wars. The coordinated 9/11 aerial attacks against the United States by Al Qaeda brought a new dimension to the air threat. Meanwhile, today, the fighter bomber has become faster, more agile and stealthy. Transport aircraft have global reach. Helicopters in the TBA are using Nap-of-Earth (NOE) techniques. The proliferation of inexpensive UAS for surveillance and targeting has added a cheap but potent weapon. The world is engaged in developing counters to the ballistic and tactical missile threat. The threat of an aerial attack launched from space today is real. Therefore, the air threat essentially includes weapons launched

from aerial and space-based platforms, and surface-launched weapons. Meanwhile, there has been an exponential increase in civil air traffic. The air space exclusive to the military is shrinking. Plans are afoot for space tourism. Air taxis are a reality. The UAS have also begun playing a greater role in day-to-day product deliveries and also for aerial policing, among many other roles. The Chinese have flooded the markets with hand-held UAS for hobbyists. The density of air traffic is, thus, increasing at a very high rate. With this intense environmental background, military and civil aviation has to coexist without severely hampering the efficient operations of either. ASC, thus, poses fresh challenges and is constantly looking for fresh solutions.

China wants to exploit the advantage of using its tactical/strategic missile force, which is easier to use for offensive than for defensive purposes. Like the IAF, the People's Liberation Army Air Force (PLAAF) is switching from net-enabled to net-centric offensive air defence, placing greater reliance on integrated attack.

AIR THREAT TO INDIA

At the strategic and tactical levels, China's air power can now achieve a variety of effects. Though its current concentration is on operations on the eastern seaboard in the South China Sea, the same weapons will be used against India. China wants to exploit the advantage of using its tactical/strategic missile force, which is easier to use for offensive than for defensive purposes. Like the IAF, the People's Liberation Army Air Force (PLAAF) is switching from net-enabled to net-centric offensive air defence, placing greater reliance on integrated attack. China's ambition is to build its air power like the USA for an asymmetric advantage. It is aiming to be one of the world's foremost air forces by 2020, made up of at least 1,000 'modern' combat aircraft. In the long term, it will settle for 80 fighter/bomber squadrons. The Russian Su-35 aircraft, along with its advanced IRBIS-E passive Active Electronically Scanned Array

(AESA) radar system has entered service and will enhance the PLAAF's capability. Of greater concern about China is the offensive capability in terms of Precision Guided Munitions (PGMs) and surface-to-surface missiles. China already has two indigenous fifth generation fighters – the J-20 and J-31 – nearing induction, a large transport aircraft, the Y-20, already flying, and a host of utility and attack helicopters under development. China is also evolving as the Wal-Mart of the UAS, making nearly 50 percent of the world's UAS for hobbyists. The Pakistan Air Force (PAF), with 20 combat squadrons, comprising around 450 combat aircraft, essentially remains an air defence-centric air force. It is heavily dependent on China for all hardware and support. The F-16, JF-17 and FC-20 will finally be the main types. Pakistan has been in talks with China to acquire the JF-31 stealth fighters and with Russia for the Sukhoi Su-35 air-superiority multi-role fighters. Pakistan has an evolving surface-to-surface missile force, including tactical nuclear ones. Pakistan and China could act in collusion, forcing India into a two-front war, and India has to cater for such a scenario.

MILITARY AERIAL PLATFORMS

The fighter-bomber aircraft remains the main instrument of prosecuting the air war and conversely also for air defence. In addition to creating air superiority for unhindered operations of surface forces, these aircraft have the capability to deliver very lethal and accurate aerial weapons deep into enemy territory to destroy the enemy's capacity to wage war. Consequently, the fighter fleets consume major portions of defence budgets. Their main characteristics are agility, super cruise, stealth, multi-function AESA radars, network-centric systems, integrated glass cockpits, fibre-optics data-transmission, multi-spectral sensors, fused situational picture, helmet mounted sights and PGMs. Fighters strive to have 'first-look, first-shoot, first-kill' ability. Other significant airborne platforms that support air operations are the Airborne Early Warning and Control (AEW&C) systems, electronic warfare platforms and aerial refuellers.

The special operations aircraft can induct Special Forces (SF) and cause havoc behind enemy lines. Transport aircraft are used for inter-theatre movement. Helicopters have a great role in tactical attack, battlefield logistics, surveillance and casualty evacuation, among others. More and more of these roles are gradually being taken over by unmanned or optionally-manned aircraft. Most army units have hand-held UAS. A large number of Surface-to-Surface Missiles (SSMs) could be in the TBA. Sometimes, long-range missiles may be used. Each of the armed forces has Surface-to-Air Missiles (SAMs). These could be long to medium range or short-range systems, including man-portable shoulder-fired ones. A big part of the ASC is the avoidance of fratricide. Most military operations evolve from tactical situations and are launched at short notice. The air force, army and navy have their own aerial platforms. There is, thus, a need for air space coordination between them, especially in the TBA and over the sea when air force elements are launched in support of naval operations.

PERMEATION OF UAS

Permeation of UAS has brought in a new challenge for ASC. The central issue contained in this is the fact that uninhabited vehicles are growing at a fast pace even in India and are likely to register an even higher growth in the times to come. Till very recently, there was a total ban on the operation of UAS in the National Air Space (NAS) system which is being gradually lifted. If these vehicles were to cohabit the same finite air space where manned aircraft (civil and military) also operate, then there is a looming danger of a collision between them. What even a perception of such a looming danger can result in was seen on August 21, 2017, when, at the Indira Gandhi International Airport (IGIA), Delhi, the pilot of an Air Asia Goa-Delhi flight sighted a Unmanned Aerial Vehicle (UAV)-like object on its approach landing path. A panic situation ensued. All the three runways of the IGIA were closed down for nearly an hour, 20 flights got delayed and 20 police and Central Industrial Security Force (CISF) teams were hurled into action to investigate the incident.

Regulation is required to supervise activities in the air space and provide for flight safety. Timely identification allows early engagement of enemy aircraft and also prevents potential for fratricide.

The growth of the UAS sector is driven by the demand for such platforms in multifarious functional areas, in both the defence and civilian domains. For the military, it is going much beyond the traditional Reconnaissance Surveillance and Target Acquisition (RSTA) role to Electronic Warfare (EW), deception operations, nuclear cloud surveillance, to a host of other military applications leading to the mother of all the teaming of the manned and the unmanned vehicles in joint operations.

AIR SPACE CONTROL METHODS

ASC requires that air space is used efficiently and effectively. ASC coordinates, integrates and regulates activities in the defined air space by identifying and monitoring all air space users. It exercises a degree of authority necessary to achieve effective, efficient, and flexible use of air space. Integration is the key. Regulation is required to supervise activities in the air space and provide for flight safety. Timely identification allows early engagement of enemy aircraft and also prevents potential for fratricide. ASC measures and procedures are disseminated to all air space users and control agencies. Essentially, there are two means to exercise control: positive control and procedural control. Positive control relies on positive real-time identification and tracking. It is conducted using radars; identification, Friend or Foe (IFF) interrogators and receivers; beacons; computers; digital data links; and communications equipment. Positive control facilities are subject to attack and sabotage. They may be restricted by line of sight coverage, electronic interference, and limited communications. Positive air control agencies must have back-up procedures to compensate for failure of part or all of their positive control systems. Procedural control relies on previously agreed upon and promulgated orders and procedures. Included in these orders and procedures are ASC measures, fire support coordinating

measures, and air defence control measures. Procedural control divides the air space by volume and time, and uses the weapons' control status to manage aviation operations. It is less vulnerable to interference by electronic and physical attack and ensures continuity of operations under adverse environmental conditions. It also serves as a back-up system if positive control is lost. Usually, procedural control is implemented to cover positive control limitations.

Air space command and control requires unity of control for the myriad actions performed by the various military elements. It requires qualified people, information, and a support structure to build a comprehensive picture of the battle space.

UNITY OF CONTROL

Air space command and control requires unity of control for the myriad actions performed by the various military elements. It requires qualified people, information, and a support structure to build a comprehensive picture of the battle space. Other field elements provide planning resources. The IAF's tactical air elements with the Indian Army and Indian Navy support coordination between the Services. Several types of control exist that can be used exclusively or combined to achieve the desired degree of autonomy in operations. Control could include directing the physical manoeuvre of in-flight aircraft or directing an aircraft or surface-to-air weapons unit to engage/disengage targets for a specified period.

Agencies and individuals that perform air control functions include the Tactical Air Centre (TAC), Maritime Elements of the Air Force (MEAF) and the early warning and control radars. Designated controllers and coordinators such as tactical air coordinators (airborne), assault support coordinators, forward air controllers (airborne and on the ground), air traffic controllers, radar controllers, information communications technology managers, the aircraft flight leader, and surface-to-air weapons units are involved. They perform air control by directing subordinate elements.

LAYERED AIR DEFENCE

Air is a complex medium. With many active players, the density of air operations, especially in the TBA, has increased phenomenally. Air defence of a vital asset or an area is normally built around a system of concentric layers. The outer layer will usually be handled by fighter aircraft with AESA radars and combinations of Air Defence (AD) missiles supported by AEW&C. If an attacker is able to penetrate this layer, then the next layers would come from surface-to-air missiles. The area-defence missiles could have ranges in excess of 150 km. The S-400 Triumph class which has a family of missiles covering different height and range bands could neutralise targets at 400 km. Other shorter range missiles would have ranges around 30-50 km. Finally, there will be the Close-in-Weapon-System (CIWS), the Very Short Range AD System (VSHORADS) missiles, the man-portable missiles and the radar controlled anti-aircraft guns firing several thousand rounds per minute.

SURFACE AND AIRBORNE RADARS

Ground-based radars are an important element to manage both the air threat and ASC. High and medium powered surveillance radars, tethered aerostat radar balloons, missile acquisition and guidance radars, tactical battlefield mobile radars and ship-based radars are all part of the ground sensor network. Radars such as Raytheon AN/MPQ-35 can detect high/medium-altitude threat for the MIM-23 Hawk surface-to-air missile system. The Northrop-Grumman AN/TPS-75 is a transportable three-dimensional air search radar. The S 400 has a panoramic radar detection system (range 600 km) with protection against jamming. The Chinese ground-based radars include the very powerful REWY-1 long range surveillance radar and YLC-18 medium range low-altitude 3D radar. The Russians have the 'Duga' series of over-the-horizon radars and Don-2N and Voronezh anti-ballistic missile radars. To cater for the stealth aircraft threat, Russia, China and Israel are developing very long-range L, UHF and VHF (Low, Ultra High Frequency and Very High Frequency) wavelength radars.

Air Traffic Control (ATC) radars and controllers perform a significant role in air space management. India has a large number of ground radars such as the indigenous Rajendra and Rohini, Elta Medium Powered Radars (MPR), and the GS100 Low-Level Transportable Radars (LLTR) – developed jointly between Bharat Electronic Limited (BEL) and Thales – are under induction. The Defence Research and Development Organisation (DRDO) is developing the 'Arudhra' MPR. Low Level Light Weight Radars (LLLWRs) have been developed for the mountainous and high altitude regions. High-powered radars with a range of more than 500 km, to replace the THD-1955, are being identified. The IAF already has Israeli Rafael aerostat radars with a range of 400 km. The DRDO is also working on the indigenous 'Akashdeep' aerostat.

The AEW&C system is an airborne radar picket system designed to detect aircraft, ships and vehicles at long ranges and perform command and control of battle space and air engagements by directing fighter and attack aircraft strikes. The AEW&C is also used for surveillance and frequently performs the Battle Management and Command and Control (BMC2) functions similar to an ATC. It also allows the operators to detect and track targets and distinguish between friendly and hostile aircraft much farther away than a similar ground-based radar. Because of its mobility, it is much less vulnerable to counter-attack, though it will be targeted by enemy fighters and missiles. AEW&C aircraft are used for both defensive and offensive air operations. The Northrop Grumman E-2 Hawkeye, the Russian A-50, the IAF's IL-76-based Phalcon, the Chinese KJ-2000 and the Indian DRDO's Embraer-145-based Netra are some examples of AEW&C aircraft. The US Air Force's (USAF's) E-3 Sentry mounted on the Boeing-707 aircraft platform – or more recently on the Boeing 767 – is a frontline Airborne Warning and Control System (AWACS). There is a large number of helicopter Airborne Early Warning (AEW) systems such as Sea King ASaC7, Agusta Westland EH-101A and Russian Kamov Ka-31.

AIR SPACE AND FIRE SUPPORT COORDINATION

A critical part of ASC is to outline hostile criteria for identifying targets and coordinating fires. The ASC area is laterally defined by the boundaries of

the component's area of operations. Air control points are earmarked on the ground for the aircrew to route to their targets and provide a ready means of conducting fire support coordination. The points must be easily identified from the air and support the ground tactical force scheme of manoeuvre. Each control point is based on the tactical situation and promulgated through the daily orders. Air control points can be designated separately for entry/exit, en route, orbit/holding, contact point, rendezvous, egress control, penetration, ingress, and return. Friendly aircraft en route to, and returning from, combat missions need to avoid enemy air defence systems yet be visible to friendly air defence systems. These control procedures must allow friendly aircraft to move safely throughout the TBA by utilising predictable flight paths for positive identification. Inter-Service aviation operations could be based on coordinating altitudes to operate to create buffers, restricted operations area/zone, designating minimum risk routes. Fire support coordination allows opening areas of the battle space for rapid engagement of targets or to restrict and control fires. Fire support coordinating measures also safeguard friendly forces and favorably impact directly on operations, especially Suppression of Enemy Air Defences (SEAD). Permissive fire support coordinating measures facilitate the attack of targets, especially at the Forward Edge of the Battle Area (FEBA). Restrictive fire support coordinating measures provide safeguards for friendly forces. The no-fire area serves to protect friendly resources. In the air defence action area, friendly aircraft or surface-to-air weapons are normally given preference to conduct air defence operations.

WEAPONS CONTROL AND COORDINATION

An attempt is made to decentralise control of assets in most situations to allow the maximum flexibility to attack or counter the threat from aircraft and missiles. Decentralised control is the normal war-time mode of control for air defence. Even under centralised control, the right of self-defence is never denied. An Air Defence Identification Zone (ADIZ) consists of air space that requires ready identification, location, and control of aerial platforms. Typically, an ADIZ is used for sovereign national boundaries,

or in the case of areas of operations, for identification while entering the air space of rear areas. In the weapons engagement zone, responsibility for engagement normally rests with a particular weapon system. There are areas where fighter aircraft have the clear operational advantage over surface-based systems. Surface-to-air missile systems will not be allowed to fire weapons in this area unless targets are positively identified as hostile. In the missile engagement zone, the responsibility for engagement normally rests with missiles. This could be a high-altitude or low-altitude zone. There are areas where multiple air defence weapon systems are simultaneously employed to engage air threats through sector separation. The Base Air Defence Zone (BADZ) is an air defence zone established around an air base and limited to the engagement envelope of short-range air defence weapon systems defending that base. Low Altitude Air Defence (LAAD) assets are employed at the BADZs. Emission Control (EMCON) regulates the use of electromagnetic, acoustic, and other emitters to optimise command and control capabilities, thus, minimising the detection of assets by enemy sensors and reducing mutual interference among friendly command and control systems. EMCON also aids in executing a military deception plan.

AIR SPACE CONTROL AND TECHNOLOGIES

Air defence interface is critical to effective combat zone air space control. Communications data-link architecture enables this process. Timely, tailored and fused intelligence is integral to all operations. There is a need to produce and disseminate aviation-specific all-source intelligence, including assessments of adversary capabilities and vulnerabilities, target analysis, Battle Damage Assessment (BDA), and the current status and priority of assigned targets to assist in execution daily changes. The same is meant for marine tactical air operations, related to the landing force during amphibious operations.

The sector air defence commander is responsible for air defence warning and weapons release conditions, launching the Operational Readiness Platform (ORP) aircraft or diverting airborne aircraft to attack time-critical

Proper coordination with civil air operations is especially important during transitions into, or out of, war-time status or during non-war-time periods of heightened tension. Additionally, allowing maximum use of navigable air space by civil aircraft is necessary.

targets. They provide positive air space control, management, and surveillance. They also provide en route air traffic control and navigational assistance for friendly aircraft. They also provide close, broadcast, tactical or data-link control to Defensive Counter Air (DCA) missions. They can provide control for sweeps and escort missions and routing or coordination for SEAD or surface strikes. They are also normally responsible for activating a designated BADZ and providing early warning and

cueing to surface-to-air weapons units within the BADZ. Command and control systems are susceptible to electronic attack (jamming) and electronic warfare support (deception, intrusion, and interference) operations. Effective training in recognising and acting on electronic warfare actions, along with proper employment of active and passive measures, i.e. electronic protection, deception, and operations security, can minimise or negate enemy electronic warfare effects. Among the technology requirements are the primary and secondary radars for control and situational awareness, aircraft transponders, flight data processing systems, special software for fully automated systems and conflict alerts and algorithms for possible vectoring solutions. Controller pilot data-link communications and Operational Data-Links (ODLs) allow digital messages to be sent between platforms and ground systems. Screen content recording allows better reconstruct and post event analysis.

AIR SPACE CONTROL IN THE TBA

The air space control handles all issues related to the air-tasking cycle. De-confliction is a critical part handled at the Air Operations Centre, and later at the Control and Reporting Centre (CRC), AWACS and ATC levels. Air space control and area air defence operations should be capable of functioning in a degraded Command and Control (C2) environment. The air component

commander must ensure that items on the surface commander's defended asset list and critical asset list are protected from attack. It is important to define the theatre-specific area map reference system in use so that air and surface elements remain geographically on the same grid. Proper coordination with civil air operations is especially important during transitions into, or out of, war-time status or during non-war-time periods of heightened tension. Additionally, allowing maximum use of navigable air space by civil aircraft is necessary.

The army manages the surface coordination, the navy manages the maritime picture and the air force coordinates the ASC. The air defence of the nation is the IAF's responsibility.

TBA: INDIAN SCENARIO

In the TBA, the enemy air tries to engage our surface forces. Similarly, the IAF will support the Indian Army through air operations. There will be many joint or special operations. Between the Indian armed forces, the domains are clearly demarcated. The army manages the surface coordination, the navy manages the maritime picture and the air force coordinates the ASC. The air defence of the nation is the IAF's responsibility. The air defence of the army's and navy's integral assets is their own responsibility. The big situational air picture is created by the IAF using its own, civil and other Services radars. Such a picture is made available at the Tactical Air Control (TAC) level to the army and at the Maritime Element of the Air Force (MEAF) level to the navy. The air defence clearance for all air movement is given by the IAF. Very low flying army air assets within a small bubble of air space do not require any clearance but the flight information has to be digitally communicated. Similarly inter-ship naval helicopter flights are managed by the navy. All flights within the ADIZ require IAF air defence clearance. Naval flights beyond the ADIZ are managed by the navy. IAF attack and support aircraft flying in support of the Indian Navy beyond the ADIZ are coordinated by the Indian Navy. Such coordination is very necessary to

avoid fratricide. Any hold-fire order passed by the IAF would be for short durations over a small geographical area so that full-scale operations of the army/navy are not hampered. Low-level routing of IAF aircraft through the TBA is normally through points in joint knowledge. The IAF aircrew acting as Forward Air Controllers (FACs) also support ASC at the tactical level. There is interface between the IAF and the army at Corps HQ and Command HQ levels to iron out day-to-day issues and jointly monitor the progress of the battle. Similarly, air elements operate with the Indian Navy. The IAF is in the process of aligning the ASC function through its Integrated Air Command and Control System (IACCS) designed for controlling and monitoring air operations by the air force at the strategic and tactical levels. The ASC organisation also takes in its fold the civil aviation with detailed and institutionalised tie-up between the IAF and the Directorate General of Civil Aviation (DGCA).

CIVIL AIR TRAFFIC

According to aviation analysts, the total number of civil and military aircraft currently in service around the world is approximately 39,000 aircraft; this does not include light aircraft. Some 4,100,000,000 passengers flew in 2017. The International Civil Aviation Organisation (ICAO) says that the “global air transport network” doubles in size at least once every 15 years, and that it is expected to do so again by 2030. Boeing, one of the world’s biggest aircraft manufacturers, says that there is a need for 39,620 new planes over the next 20 years, so by 2037, there could be 63,220 aircraft in the world. According to FlightRadar24 – which tracks aircraft around the world – during the peak July/August months there could be 16,000 flights in the air at a given time. The Federal Aviation Authority’s (FAA’s) Next Generation Air Transport System (NAS) will transform the current air space and shorten air routes. Currently, pilots and controllers mostly communicate using VHF and UHF radios. Controllers and pilots also communicate using data-links to reduce radio congestion. The Global Positioning System (GPS) navigational aids are used for air navigation. The NextGen programme is meant to reduce both

flight time and congestion and, in turn, fuel consumption and emissions. There have been many incidents during the Cold War and, more recently, near conflict zones where airliners have been shot by air defence aircraft and missiles. Any air space management has to ensure civil aircraft safety and allow maximum freedom of operations in time and space.

TERRORISTS IN THE AIR

The September 2011 coordinated air attacks over America by terrorists hijacking airliners and making suicide attacks against ground targets brought a new dimension to the air threat. Any aerial platform or weapon falling into terrorist hands could, thus, have implications. An immediate concern is terrorists acquiring weapon-laden Unmanned Aerial Vehicles (UAVs) or commandeering a manned aircraft. Motivated terrorists could train to join civil or military aviation and later indulge in suicide attacks. A terrorist has the advantage of choosing the time and place of attack. While response to the threat would be conventional, better surveillance, policing, and prevention of weapons going into their hand is more important. Air defence procedures have to be tailored to tackle possible rogue aircraft manoeuvres at short notice.

SPACE-BASED MILITARY AND CIVIL APPLICATIONS

Space has been used for positioning satellites using a variety of optical, Infra-Red (IR) and radar-based sensors for surveillance, accurate mapping, communications, data networking, GPS, etc. The dependence on space for ground operations has become phenomenal. For any war between major rivals, it will be important to decapitate such systems to degrade the enemy war effort. The number of satellites is increasing every day. The day is not far when hypersonic airliners will transit through near space. Space tourism is already on the 'horizon.' The line dividing space and atmosphere is thinning and, therefore, the new reality is that space-based systems have a direct bearing on operations on the ground, adding a new dimension to the ASC.

Cyber war doesn't require huge armies with attendant logistics and can be launched by a single operator with a simple computer. All networked civil utilities like water, electricity, banking, trade, transportation, etc. can be ground to a stop through a cyber attack which could have an impact as devastating as a nuclear bomb.

Space weapons can be categorised as those that attack targets in space (anti-satellite); or attack targets on the ground from space; or attack targets transiting through space (anti-ballistic missile). The US and the Soviet Union began developing Anti-Satellite (ASAT) weapons in the early 1960s. They were in the form of directed-energy lasers to decapitate; kamikaze satellites for hard-kill; and possible orbital nuclear weapons. Ground-based Air Defence (AD) weapons have to cater for long range ballistic attacks transiting through space. The Russian ASAT research has reportedly been resumed under President Putin to counter the renewed US

strategic defence efforts post US' withdrawal from the Anti-Ballistic Missile (ABM) Treaty. The National Aeronautics and Space Administration (NASA) space plane X-37, now with the US Department of Defence, is akin to a space version of a UAS and its employability is evolving.

Research is on into directed energy weapons, including a nuclear-explosion powered X-ray laser. Many countries like the USA, Russia, China, India and Israel have anti-ballistic missile programmes, with exo-atmospheric interception capability. International space treaties limit or regulate positioning of weapons or conflicts in space. The air defence assets required to defend against a ballistic missile, SSM or a cruise missile may be similar.

NETWORK-CENTRICITY AND CYBER THREAT

All operations today are based on network-centricity. Platforms are electronically talking to one another and sharing critical data. Commanders are taking operational decisions based on Situational Awareness (SA) created by networked sensor inputs. Each Service has its own secure dedicated net.

Also, there are inter-Service networks for sharing common domain information. The entire aerospace management is based on connectivity. A major part of the cyber war will, thus, be to attack the surveillance and control systems of the enemy. Any attack on the military networks can be critical for the outcome of the war. Cyber war doesn't require huge armies with attendant logistics and can be launched by a single operator with a simple computer. All networked civil utilities like water, electricity, banking, trade, transportation, etc. can be ground to a stop through a cyber attack which could have an impact as devastating as a nuclear bomb. Military communication and surveillance networks can be infected or blanked out with disastrous results. Organisational or personal hardware and networks can be targeted. Malicious bugs can be inbuilt into computer systems or in microchips at the manufacturing stage. The time and place of attack can be chosen and, therefore, some also call it 'cyber-terrorism'. For any ground-based air defence network to succeed, it has to defend its various elements from cyber attacks.

The DRs also specify certain restricted areas for operation of drones. They cannot be operated within an area of 5 km from an airport or within permanent or temporary prohibited, restricted or danger areas as notified by the Airports Authority of India (AAI) or without prior approval over densely populated areas or over or near an area affecting public safety, or where emergency operations are underway

UAS CIVIL REGULATION APPROACH

The problem of regulation of the UAS is the biggest challenge in the ASC domain today. India's Directorate General of Civil Aviation (DGCA) announced Draft Regulations (DRs) on the civil use of UAS in the NAS on November 1, 2017. The same will be finalised after comments from the environment. A large part of the document is on the lines as announced by the Federal Aviation Authority (FAA) in the USA. According to the DRs, the UAVs have been classified according to their weight, i.e. nano

(250 gm or less), micro (250 gm-2 kg), mini (2 kg-25 kg), small (25-150 kg) and large (greater than 150 kg). All UAS (referred to as drones in the DRs) are proposed to be operated in visual line of sight during day time only and below 200 ft. All commercial drones, except those in the nano category and those operated by government agencies, have to be registered by the DGCA as per the International Civil Aviation Organisation (ICAO) regulations in the form of a Unique Identification Number (UIN). The mini and higher categories will require an Unmanned Aircraft Operator Permit (UAOP). The DRs mandate that all the remote pilots must undergo requisite training except for those using drones in the nano and micro categories. All micro and higher category drones will have to be equipped with Radio-Frequency Identification/Subscriber Identity Module (RFID/SIM) with a return to home option and anti-collision lights.

The DRs also specify certain restricted areas for operation of drones. They cannot be operated within an area of 5 km from an airport or within permanent or temporary prohibited, restricted or danger areas as notified by the Airports Authority of India (AAI) or without prior approval over densely populated areas or over or near an area affecting public safety, or where emergency operations are underway, or within 50 km of the international borders and beyond 500 m (horizontal) into the sea along the coastline. Also, drones cannot be operated within a certain distance from a mobile platform such as a moving vehicle, ship or aircraft. Military drones will follow guidelines as for manned military aircraft.

MILITARY-CIVIL COORDINATION

Any threat to India will require an integrated approach of all national air assets. The Indian armed forces will requisition airliners and cargo planes for inter-theatre movement. Similarly, civil helicopters will be used for communication and air ambulance duties. Expressways will be used for operations in emergencies. A key element will be civil radars and ATC networks. Networking, liaison and peace-time training will

make the process more efficient. Military aircraft would be accorded direct routing priority. There will be height band restrictions on civil traffic during operations.

DUAL-USE AIRFIELDS

A large number of military airfields are being used for civil traffic. Conversely, a few civil airfields are being used for military operations. Dual-use airfields have typical operational peculiarities. Most fighter aircraft require arrester barriers or tail-hook cables. There are peculiar security issues for military airfields. Also, many air bases will have fully armed aircraft on Operational Readiness Platforms (ORPs) for take-off at short notice. Procedures for approach and landing of a battle-damaged aircraft are considerably different. Civil aprons may be used for dispersal of IAF assets. The ASC has to factor in all these peculiarities.

ARTIFICIAL INTELLIGENCE IN AIR SPACE MANAGEMENT

The development of computer systems to be able to perform tasks that normally require human intelligence such as visual perception, speech recognition, decision-making, and translation between languages, i.e. Artificial Intelligence (AI) has great scope for ASC. Intelligent machine systems can interpret complex data, perceive the environment and take appropriate action using learning and problem-solving techniques. AI processes include perception, reasoning, knowledge, planning, learning, statistical analysis, computation and, finally, manipulated output. AI has evolved using expertise in fields like computer sciences, mathematics, psychology and neuroscience, among many others. AI applications already exist in industrial machines, automotive industry, surgery and aviation, among others. Another school of thought is to use the phrase 'extended intelligence' to signify how AI is used to augment human decision-making rather than replace it. The London Air Terminal Control operations are already using AI for air space infringement monitoring. AI will help Go-No-Go decisions. AI will relieve the air traffic controller from the current chronic

fatigue. The US Defence Advanced Research Projects Agency (DARPA) has been working with Lockheed Martin's Advanced Technology Laboratories to develop AI technology that keeps air space operating safe despite UAS and other airborne weapons.

CHALLENGES AND WAY AHEAD

Manned aircraft and UAS are going to operate in the same air space and at the same time, and avoiding collision between them will be a major issue and a major challenge. Onboard collision avoidance and advanced traffic display systems will support the effort. The cockpit will be 'information rich' and it will be critical that we ensure the integrity and security of data. The human-computer interface will be crucial. For emerging powers like China and India, the big challenge is to get all the agencies and systems to switch to newer technologies together. The TBA will have very accurate lethal weapons. The air traffic and projectile density in the TBA will continue to increase. Humans' reliance on machine intelligence will only increase in the days ahead. The air space in future will be 'dense and dynamic' and platforms will follow point-to-point navigation.

All sensors are becoming more accurate, allowing a very realistic day and night, all weather, 3-D situational picture to manage the air space more efficiently. AI will support the human controller for quick decision-making. It will give greater freedom of operation to all operators. The 'hold-fire' orders will get minimised in time and space. De-confliction will be automatic and continuous in real-time. Networks will allow the control centres to be secure and placed at long distances from the fog-of-war. Technology will allow civilian pilots and military aircrew greater freedom to choose flight paths and diversions even in real-time. While the NextGen initiatives will be more automatic, they will be flexible enough to accommodate a wide range of users. More and more UAS will have to be controlled or ordered through data-links. Cyber security will have to be ensured. Procedural back-ups will have to remain in place. The technologies are evolving very quickly. It is imperative for any emerging nation to move with the times.

To effect better air space control in the evolving high density environment, greater flight and target information flow through secure networks would be important. The weapon performance and safety information once fed into the system will allow computers to predict the safe bubbles, thereby, improving situational awareness and allowing better decision-making. Also, it will greatly reduce the restrictions imposed on ground-based weapon systems and aircraft. It will be much faster and will greatly reduce target-to-shooter time. It will also reduce the risk of fratricide. All communications with UAS will have to be through the consoles of the operators. Digital flow of information and decision-making, supported by AI, will help the commander and operator for making the best choice between myriad options. The basic structure and level of decision-making is well evolved and time-tested and requires no change.

Till such time that these systems are in place, reliance on the time-tested super-computer – the human brain – will be necessary. Training will be imperative to ensure that those at the sharp end of the stick are able to perform their functions to ensure the highest level of air space control to not only challenge an intruder, but, more importantly, to avoid any blue-on-blue kills.

REFLECTIONS ON INDIA'S SPACE PROGRAMME

T H ANAND RAO

There are some who question the relevance of space activities in a developing nation. To us, there is no ambiguity of purpose. We do not have the fantasy of competing with the economically advanced nations in the exploration of the moon or the planets or manned space flight. But we are convinced that if we are to play a meaningful role nationally, and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society.

— Dr. Vikram Sarabhai

As a country with growing development needs and profound security concerns, India is at the threshold of rediscovering itself as a space power. While doing so, India is faced with the dilemma of negotiating the delicate balance between the use of space for social upliftment and military use. In spite of the developments in counter-space technologies by the world leaders in space, India has managed to maintain a consistent approach in using space and space research for peaceful purposes, even after four decades of being labelled as a space-faring nation. It is interesting to note that India is the only space-faring country where rockets were developed exclusively as satellite launch vehicles and not modified from ballistic missiles, as has been

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A number of scientific, and technological applications, including tele-medicine, tele-education, disaster warning, search and rescue operations, mobile communications, weather and remote sensing being successfully implemented is testimony to the peaceful intentions of India's space programme.

the case with all other space-faring countries where ballistic missiles were developed first and then modified for launching satellites. Exploitation of space for socio-economic upliftment was, therefore, envisioned right from the inception stage of India's space programme. Despite having the third largest space budget in Asia¹, owning 3 percent of the world's operational satellites and being ranked sixth in the global space order, India, till recently, had no dedicated military satellites. A number of scientific, and technological applications, including tele-medicine, tele-education, disaster warning, search and rescue operations, mobile communications, weather and remote sensing being successfully implemented is testimony to the peaceful intentions of India's space programme. India has also leapt into space exploration with the 'Chandrayaan' and 'Mangalyaan' missions which have been largely successful.

While the success in space exploration, satellite launch, satellite and rocket assembly and space ancillary manufacture has boosted the credentials of India's space capability, the missing punch is in the absence of any defensive or offensive capability in India's critical space-based assets. There is an increasing concern about the vulnerability of these space assets to a discreet attack by an adversary which may temporarily or permanently incapacitate a satellite. China's Anti-Satellite (ASAT) weapon test in 2007, in which it destroyed a defunct weather satellite (FY-1C) at an altitude of 530 miles, using a KT-2 missile was a wake-up call not only for India but for the global space-faring community as a whole. The test clearly illustrated the challenges right in India's own neighbourhood. Though this was not the first time an ASAT was tested, it created an apprehension for the security of space assets.

1. "Government Spending in Space Programs Reaches \$62 Billion in 2016", Euroconsult, at http://www.euroconsult-ec.com/30_May_2017. Accessed on May 17, 2018.

Space was thought to be a safe domain by the US and Russia which had scaled down their counter-space programmes after the Cold War era. The emergence of China with offensive space capabilities triggered an era of ASATs, causing concerns for weaponisation of space.

India continues to maintain a posture favouring use of outer space for peaceful purposes in accordance with the existing international laws governing activities in outer space, while the world's space powers have given space the highest national security priority. The US has openly stated its keenness to go all out to ensure freedom of operation in space in its National Security Strategy 2017,

a bold and unambiguous statement to form a space force in the US Space Policy Directive-3 of June 2018, while China has continued development of soft kill ASATs, which has forced a rethink by other countries (on how to protect their space-based assets from such an attack in the future). India has to realign its space programme to cater to the space threat environment that exists in the current geopolitical dynamics. Is the traditional orientation of India's space programme holding it back from aligning with the space security requirements as are being undertaken by developed space-faring nations? A peek into the evolution of India's space activities over the years is necessary to assess the future trajectory.

The US has openly stated its keenness to go all out to ensure freedom of operation in space in its National Security Strategy 2017, a bold and unambiguous statement to form a space force in the US Space Policy Directive-3 of June 2018, while China has continued development of soft kill ASATs, which has forced a rethink by other countries.

OPPORTUNITIES, MILESTONES, SUCCESSES AND SETBACKS

The shifting of the Indian Space Research Organisation (ISRO) from the Atomic Energy Commission (AEC) to the then newly formed Department of Space under the Space Commission in 1972 was probably the opening of a gateway of opportunities for India's space ventures. Another critical

decision was Dr. Vikram Sarabhai's initiative to leapfrog the process of development by acquiring and developing competence in advanced technology for resolving the peculiar situations faced by India at that time². Focussing on space research and exploration would have been a time consuming and superfluous process, given the advances made by other space-faring countries. This effort paid dividends in the Satellite Instructional Television Experiment (SITE) in 1975 with the collaboration of the National Aeronautics and Space Administration (NASA) and, later, the use of acquired remote sensing data for various applications like estimating crop yield, famine assessment, disaster relief, location of fishing stocks, forest cover, etc. Landsat data, offered by the US, along with a ground receiver station in 1979, benefitted India to a great extent.³ The focus on developing satellite applications clearly played a vital role of creating a sound backing for development of indigenous space infrastructure.

India's foreign policy of the 1970s-80s and its advocacy of non-alignment was beneficial in deriving technical assistance from not only the superpowers, but also from Japan, West Germany, France and other countries⁴. While the US facilitated contacts between Indian and NASA scientists in developing ground stations and working on the design of a first generation satellite system (INSAT), the Soviet Union provided access to its launch vehicles in a bilateral agreement for providing access to Indian ports for Soviet space tracking ships. Indian scientists worked with General Electric, Hughes Aircraft and experts at the Massachusetts Institute of Technology for designing satellite and associated space systems.⁵ The availability of a Soviet launcher was a trigger for speedy development of India's first indigenous satellite—Aryabhata—which was launched aboard a Cosmos 3M rocket in April 1975. Though the solar electric power system of Aryabhata malfunctioned after six

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2. V.S Mani, "Space Policy and Law in India and its Relevance to the Pacific Rim", *Journal of Space Law* 35, no.2, Winter 2009, pp. 618-619.
 3. Daphne Burleson, *Indian Space Research Organisation (ISRO): Space Programmes Outside the US: All Exploration and Research Efforts, Country by Country* (Jefferson, North Carolina: Mc Farland & Co., 2005), p. 144.
 4. Sundara Vadlamudi, "Indo-US Space Cooperation: Poised for Take-Off?", *The Non-proliferation Review* 12, no.1, March 2005, p. 200.
 5. *Ibid.*, p. 202.

orbits, it provided invaluable lessons for the design of the second satellite—Bhaskara-I—which had Soviet photovoltaic cells and better instrumentation.⁶

Launch vehicle development lagged behind the satellite programme, though tests on a four-stage solid fuel Satellite Launch Vehicle (SLV-3) began in 1979 at the newly constructed launch site, Sriharikota. SLV-3 technology was derived from the US Scout missile, though 85 percent of its components were domestically manufactured⁷. It was capable of placing a 40 kg payload in Low Earth Orbit (LEO). The first experimental flight of the SLV-3, in August 1979, was only partially successful, as it failed five minutes after launch and fell into the Bay of Bengal with an experimental satellite onboard. The SLV-3 was later successfully launched on July 18, 1980, from the Sriharikota range, when the Rohini satellite, RS-1, was placed in orbit, thereby making India the sixth member of an exclusive club of space-faring nations. The successful culmination of the SLV-3 project showed the way to advanced launch vehicle projects such as the Augmented Satellite Launch Vehicle (ASLV), Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV).⁸

With the success of the SLV-3 and with indigenously developed satellites in orbit, India was placed in the elite group of nations which had independent access to space. For the next stage of the journey into space, viz. launching a geostationary satellite, India received assistance from France in launching the Ariane Passenger Payload Experiment (APPLE), which entered geostationary orbit in June 1981. It was designed and built in just two years, with limited infrastructure, in industrial sheds. It gave ISRO valuable hands-on experience in designing and developing three-axis stabilised geostationary communication satellites as well as in orbit raising manoeuvres, in orbit deployment of appendages, station keeping, etc. APPLE was used for nearly two years to carry out extensive experiments on time, frequency and code division multiple access systems, radio networking

6. Brian Harvey, *The Japanese and Indian Space Programmes: Two Roads into Space* (London: Springer, 2000) p. 134.

7. *Ibid.*, p. 136.

8. "SLV", at <https://www.isro.gov.in/launchers/slv>. Accessed on June 20, 2018.

India could have benefitted more from the US expertise in space technology, but the Soviet occupation of Afghanistan in 1979 changed the US stance towards India, bringing a temporary setback to the Indo-US space cooperation.

computer interconnect, random access and pockets switching experiments.⁹

India's capabilities in designing and operating communication satellites benefitted from cooperation with the Franco-German Symphonie satellite from 1977-79.¹⁰ Also, India signed a contract with the Ford Space and Commerce Corporation in the US for the first seven INSAT systems¹¹. This was a vital move in acquiring technology and skills required to indigenously build and operate satellites.

INSAT-1A was launched by the NASA's Delta launcher in April 1982, thus, connecting the 31 ground stations built to connect India with the space network¹².

India could have benefitted more from the US expertise in space technology, but the Soviet occupation of Afghanistan in 1979 changed the US stance towards India, bringing a temporary setback to the Indo-US space cooperation. In the 1980s, the Soviet Union became a strong ally of India. Many deals in defence cooperation were inked which included purchase of military hardware on soft terms. The Soviet Union also offered to train and launch India's first astronaut aboard the Salyut-7 space station. After almost three years of training, India's first astronaut, Sqn Ldr Rakesh Sharma was launched into space on a Soyuz T-11 rocket on April 2, 1984, along with two other Russian cosmonauts. He spent 7 days, 21 hours and 40 minutes aboard the Salyut 7 during which his team conducted scientific and technical studies which included 43 experimental sessions. At around the same time, despite the political differences between the US and India, the Reagan Administration offered a slot onboard the space shuttle Challenger to fly a payload specialist and to deploy the INSAT-3 into orbit. But the unfortunate accident in which the space shuttle Challenger exploded after

9. "APPLE", at <https://www.isro.gov.in/Spacecraft/apple>. Accessed on June 20, 2018.

10. S Dhawan and U R Rao, "The Indian Space Programme", in *Proceedings of the Thirteenth International Symposium on Space Technology and Science* (Tokyo: Agne Publishing, 1982), p.23.

11. Vadlamud, n. 4, p. 202.

12. Dhawan and Rao, n. 10, p. 24.

launch in January 1986, and India's decision to independently launch its satellite, resulted in the shelving of the collaborative effort.¹³ India's space destiny could have been different had the events not unfolded in this manner. In a sense, India distanced itself from the US in space cooperation, though it was a transient phase.

The need to develop bigger rockets that could put heavier rockets into orbit led to the progressive modification of the SLV-3 to the ASLV and PSLV. The ASLV was an SLV with two strap-on boosters which could carry a 150kg class satellite into a 400 km orbit. The ASLV proved to be a low cost intermediate vehicle to demonstrate and validate critical technologies that would be needed for the future launch vehicles like strap-on technology, inertial navigation, bulbous heat shield, vertical integration and closed loop guidance. The first successful launch was carried out in 1992 after two failed development flights in 1987 and 1988.¹⁴ To carry bigger satellites into orbit, ISRO progressed to the PSLV which was capable of placing a 1.75 ton payload in a polar orbit of 600 km altitude and a 1.4 ton payload in a geosynchronous transfer orbit. The PSLV is the third generation launch vehicle of India. It is the first Indian launch vehicle to be equipped with liquid stages. After its first successful launch in October 1994, the PSLV emerged as the reliable and versatile workhorse launch vehicle of India, with 39 consecutively successful missions by June 2017. During the 1994-2017 period, the vehicle launched 48 Indian satellites and 209 satellites for customers from abroad. Besides, the vehicle successfully launched two spacecraft – Chandrayaan-1 in 2008 and the Mars Orbiter Spacecraft in

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13. Harvey, n. 6, p. 165.

14. "ASLV", at <https://www.isro.gov.in/launchers/aslv>. Accessed on June 22, 2018.

2013 – that later travelled to the Moon and Mars respectively.¹⁵ The growing success of the PSLV and technology proliferations into India's ballistic missile programme attracted curbs from the Missile Technology Control Regime (MTCR), which led to the US and other Western countries to cease technological cooperation with India.

The break-up of the Soviet Union in 1991 brought in new challenges in India's space journey. Financial and technical assistance provided by the US necessitated Russia's compliance with the MTCR. Moreover, military hardware and technology was only available on stringent financial terms. This affected the GSLV programme, as the contract with the Soviet commercial space agency, Glavkosmos, for the sale of cryogenic liquid fuel engines which was announced in 1991, was scrapped due to the sanctions imposed on Glavkosmos by the US for defaulting on MTCR guidelines. Though the deal was truncated to delivery of only finished rocket boosters, transfer of cryogenic technology was halted.¹⁶ This is seen as an event which ensured indigenous development of cryogenic engines by ISRO, and as a blessing in disguise for the accelerated development of the indigenous cryogenic stages for the GSLV. Further, India's nuclear tests in May 1998 sealed any scope of revival of Indo-US cooperation in space for the following few years.

By the end of the last century, India was a nuclear and space power. The space programme was maturing, with India being in the league of space-capable nations. Despite advances made in space technology, the Kargil War of 1999 was deprived of any space-based intelligence in terms of imagery analysis that could have given the precise location of incursions in the Kargil heights. Many aerial reconnaissance missions were flown in the area by a variety of aircraft but the time lag involved in mission planning, reconnaissance sorties, imagery analysis and dissemination of intelligence made it a cumbersome process, and at times, irrelevant. Availability of timely satellite imagery during the Kargil conflict could have changed the course of

15. "PSLV", at <https://www.isro.gov.in/launchers/pslv>. Accessed on June 22, 2018.

16. Richard Speier, "US Satellite Space Launch Cooperation and India's Intercontinental Ballistic Missile Programme" in Henry Sokolski, ed., *Gauging US-Indian Strategic Cooperation* (Carlisle, Penn.: US Army War College, Strategic Studies Institute, March 2007), p. 194.

the conflict, or may be the conflict itself could have been averted if intelligence inputs had been available through satellite imagery.

Two events which changed the US policy on export control towards India were the terrorist attack on the World Trade Centre (September 2001) and the Chinese ASAT test in 2007. The first event brought India closer to the US in its “Global War on Terror” and the US began looking at India as an ally, and the consequent easing of non-proliferation sanctions. The Next Steps in Strategic Partnership (NSSP) agreement in January 2004 spelt out nuclear and space cooperation as two key areas for advancement, paving the way for the US giving concessions on export controls for NASA’s cooperation in space science with ISRO. The results were soon seen in the Chandrayaan-1 mission of 2008, which carried a US instrument as payload and was successful in detecting traces of water vapour on the Moon. In later years, US-India cooperation extended to other areas in the civilian space domain, like the current NASA-ISRO Synthetic Aperture Radar (NISAR) satellite project which is expected to be launched in 2021.¹⁷

Commercialisation of India’s space industry was another turning point in India’s space journey, which was a follow-on to the success of the PSLV as a reliable space launch vehicle. Collaboration with foreign countries, while enabling cooperation in research and development also attracted many customers for availing India’s expertise in space. ISRO has launched 237 foreign satellites till date for 28 countries,¹⁸ which has brought India to the forefront as a responsible space-faring nation. Cooperation on mutually beneficial terms like the launch of the Israeli satellite TecSar-1 in 2008 gave India access to the satellite’s high resolution imagery.

In recent years, India is seen to be diverging from its traditional focus on using space applications for national development to getting involved in the high prestige race for space exploration. The ‘Chandrayaan-I’ lunar mission brought in a new focus to India’s space programme in 2008 as it was the first

17. “ISRO and NASA Jointly Working on NASA-ISRO Synthetic Aperture Radar (NISAR) Mission”, Press Information Bureau, July 30, 2015, at <http://pib.nic.in/newsite/PrintRelease.aspx?relid=123963>. Accessed on June 27, 2018.

18. “Missions”, at <https://www.isro.gov.in/missions>. Accessed on June 27, 2018.

time India had ventured beyond the Earth orbit. The 'Mangalyaan' Mars mission displayed India's acumen in space technology by its becoming the fourth country to have reached Mars. This was a big boost to the international reputation of India's space capabilities. But the Chandrayaan-I mission, even though successful, did experience technical glitches, which highlighted weaknesses in India's space technology. The spacecraft had to be boosted into a higher orbit around the Moon due to an unexpected overheating. The effectiveness of onboard scientific instruments and other payloads was, thus, reduced. Finally, it experienced attitude control problems and impacted with the Moon's surface in 2009. The data collected though, specifically of the traces of water vapour, is said to be of immense value to the scientific community towards further research on sustainability of life on the Moon.¹⁹

India is also venturing into manned space flight with its Human Spaceflight Programme (HSP). Technical assistance is being sought from Russia since 2008 towards designing the human capsule which is to be launched on a GSLV rocket.²⁰ A demonstration of the atmospheric reentry flight of a prototype crew module of the HSP was successfully carried out as part of an experimental flight on December 18, 2014.²¹ On July 5, 2018, ISRO conducted a pad abort test for testing the crew escape system which is a critical technology towards making the human capsule operational. No timeline has been set for completion of this project, which suggests it is not a priority venture of the Indian space programme.

The success of the Chandrayaan-1 mission of 2008 and Mangalyaan mission of 2014 (Mars Orbiter Mission) set India apart from other space-faring nations in acquiring a reputation for furthering scientific research and exploration and civilian uses of outer space as a priority, while it could have utilised its technical expertise in developing military applications and counter-space programmes. The years 2016-17 comprised a remarkable period for ISRO with many successful missions being undertaken. The launch of 104 satellites in a single PSLV launch (PSLV-C37) on February 15, 2017, launch of the GSLV

19. James Clay Moltz, *Asia's Space Race* (New York: Columbia University Press, 2012), p. 132.

20. *Ibid.*, p. 133.

21. "Human Spaceflight", at http://www.vssc.gov.in/VSSC_V4/index.php/technology/human-space-flight. Accessed on July 11, 2018.

Mk-III on June 5, 2017, Scramjet engine technology demonstrator (August 28, 2016) and re-usable launch vehicle-technology demonstrators (May 23, 2016) were feathers in the cap for ISRO. Future missions to be undertaken like the Chandrayaan-2, human space flight programme and GSLV-Mk-III missions look promising in scientific research, space exploration efforts and civilian use of outer space by India. However, the recent failed launches of ISRO, which include the loss of communication with the GSAT-6A (launched on March 29, 2018) and the failure of the payload heatshield of the PSLV C-39 (launched on August 31, 2017) to separate, resulting in the loss of the Indian Regional Navigation Satellite System-1H (IRNSS-1H) satellite within a span of six months, have resulted in some momentum being lost and need introspection.

INDIA'S MILITARY USE OF SPACE

As brought out in the beginning of this article, India never looked at outer space as a domain for war-fighting. The military applications are viewed as a byproduct of civilian applications owing to the dual use technologies involved. The requirement of having dedicated military space assets was first felt in the aftermath of the Kargil War. The Kargil Review Committee report of September 2000 recommended, "Every effort must be made to ensure that a satellite imagery capability of world standard is developed indigenously and put in place in the shortest possible time"²². Consequently, India's first spy imagery satellite, the Technology Experiment Satellite (TES) was soon launched in October 2001, followed by the Cartosat series of imagery satellites and the Risat (Radar Imaging Satellite).

During the Kargil War, one of the primary requirements for precision aerial bombing missions was the Global Positioning System (GPS) data for locating target positions and accurate navigation. India is believed to have requested the US for access to the military grade signal of the area, however, the US denied it. A need was, thus, realised to have an indigenous satellite navigation system. The IRNSS was, thus, born and has now been named

22. "Kargil Review Committee Report", Annexure B, p. 121, at <http://www.vifindia.org/sites/default/files/GoM%20Report%20on%20National%20Security.pdf>. Accessed on June 27, 2018.

The Chinese ASAT test was a reminder, not only to India, but also the world's space-faring community, that space assets are no longer safe in the arena of the global commons, and new players are emerging to compete with the US and Russia. China, being a neighbour and a potential adversary of India, it was reason enough to raise an alarm.

as the Navigation Indian Constellation (NavIC).^{23 24} The space and ground segments are functional, while the user segment will be operationalised soon.

While the turning point in India's military use of space was the Kargil War, the Chinese ASAT test of 2007 was another moment of realisation that dawned on the Indian space establishment. The space tracking network, being what it was, did not detect the event and the space community came to know about the debris littering ASAT test much later. Besides revealing the gaps in space tracking capabilities, the Chinese ASAT test was a reminder, not only to India, but also the world's space-faring community, that space

assets are no longer safe in the arena of the global commons, and new players are emerging to compete with the US and Russia. China, being a neighbour and a potential adversary of India, it was reason enough to raise an alarm.

The Standing Committee on Defence, in its seventh report to the thirteenth Lok Sabha (Lower House of Parliament) in 2000 had recommended the development of an Aerospace Command as a part of the plan for modernisation of the Indian Air Force (IAF). The Ministry of Defence (MoD) was of the view that development in space technologies can be utilised by the IAF in the following ways:

- To build real-time situational awareness through space communication and space sensors.
- To link radar and other communications networks over the entire length and breadth of the country.

23. Yuji Kuronuma, "India Takes on China with its own Navigational Satellites", November 16, 2017, at <https://asia.nikkei.com/Business/Technology/India-takes-on-China-with-its-own-navigational-satellites2>. Accessed on June 28, 2018.

24. Ishan Srivastava, "How Kargil Spurred India to Design own GPS", April 5, 2014, at <https://timesofindia.indiatimes.com/home/science/How-Kargil-spurred-India-to-design-own-GPS/articleshow/33254691.cms>. Accessed on June 28, 2018.

- To assist in Ballistic Missile Defence (BMD).
- To gather real-time intelligence about enemy aircraft, missiles and space-borne threats.
- To prevent the enemy from using its space assets by resorting to jamming.

The committee again recommended in 2003 (thirteenth report) that there was an immediate need to form an Aerospace Command, but the proposal has not yet matured.²⁵

Meanwhile, India launched a roadmap for space activities in the form of Vision 2020 for space or Defence Space Vision (DSV) 2020, steered by the Integrated Defence Staff Headquarters (HQ IDS) of the MoD. HQ IDS has the task of formulating a draft space doctrine. Intelligence, surveillance, reconnaissance, and navigation had been identified as the thrust areas in the first phase (2007-12) of this vision.²⁶ The defence Space Vision 2020 outlined the need to harness the satellite resources in a big way to boost Indian defence preparedness.

The first step towards integrating India's space applications with military requirements was taken in 2010 with the creation of an Integrated Space Cell (ISC) under the HQ IDS of the MoD. The ISC has had a coordinating role with the Service Headquarters and between the armed forces and the Department of Space and Ministry of Defence for greater integration of space technology and assets into military operations. Following such developments, for the first time, ISRO built and launched dedicated military communications satellites,

The first step towards integrating India's space applications with military requirements was taken in 2010 with the creation of an Integrated Space Cell (ISC) under the HQ IDS of the MoD. The ISC has had a coordinating role with the Service Headquarters and between the armed forces and the Department of Space and Ministry of Defence.

25. Ajey Lele, "Indian Armed Forces and Space Technology", *India Review*, vol. 10, no. 4, October-December, 2011, pp. 379-393, at <http://dx.doi.org/10.1080/14736489.2011.624023>. Accessed on May 30, 2018, and at https://www.researchgate.net/publication/239789444_Indian_Armed_Forces_and_Space_Technology. Accessed on August 10, 2018.

26. *Ibid.*

the GSAT-7 (2013) for the navy, and the GSAT-6 (2015) for the armed forces.²⁷ Further, the Technology Perspective and Capability Roadmap (TPCR) of the MoD and Defence Research and Development Organisation (DRDO) lists several space-based capabilities envisioned for India's expanding space-based security needs.²⁸

Further, the MoD is working towards raising three new tri-Service agencies in the fields of cyber warfare, space and special operations, as announced in July 2017, which is in line with the Joint Armed Forces Doctrine released in April 2017. Military space operations would be coordinated by a Defence Space Agency (DSA). The ISC would likely merge with the DSA and work closely with ISRO and DRDO for better utilisation and integration of space resources. This includes information sharing from individual satellites, and surveillance from other satellites which can then be shared with the concerned defence Service.²⁹

NATIONAL SPACE POLICIES

India's space ventures have so far been government sponsored and directed towards extracting the benefits of space for socio-economic upliftment and scientific research. There was no need felt for stringent regulations within the government system of functioning, though India has abided by all international agreements and space governance policies. As a result, India remains one of the space-faring nations that has yet to enact a space legislation. The existing regulations are a policy on remote sensing data (Remote Sensing Policy Data 2011) and a guiding document for the implementation of the satellite communications policy framework (Norms, Guidelines and Procedures for the Implementation of the Policy Framework for Satellite Communications in India, 2000). ISRO functions under the directions of the Space Commission and the

27. Ajey Lele, "GSAT-6: India's Second Military Satellite Launched", August 31, 2015, at https://idsa.in/idsacomments/GSAT6IndiasSecondMilitarySatelliteLaunched_alele_310815. Accessed on July 10, 2018.

28. "Technology Perspective and Capability Roadmap-2018", at <https://mod.gov.in/sites/default/files/tpcr.pdf>. Accessed on July 10, 2018.

29. Sushant Singh, "Coming Soon: Ministry of Defence's Cyber, Space, Special Operations Divisions", October 16, 2017, *Indian Express*, at <https://indianexpress.com/article/india/coming-soon-ministry-of-defence-mods-cyber-space-special-operations-divisions-4892404/>. Accessed on July 11, 2018.

Department of Space (DoS), but with no space legislation in place. With private players emerging on the skyline, a necessity was felt to have a firm legislation to regulate space activities in India, and, thus, a draft Space Activities Bill, 2017, was put up in the open domain for comments. The legislation is likely to be passed by an Act of Parliament. China too is yet to enact legislation for outer space activities, more so because of its desire to open up space exploration to private companies. Presently, China has adopted two space laws and published three White Papers on its space activities. The laws deal with administration of registration and licensing of space objects launched from China. Other Asian countries that have forayed into space, like Iran, Japan, South Korea and Indonesia (soon to be a space capable country) have enacted space legislations.

ORGANISATIONAL STRUCTURE

ISRO was brought under the newly-created DoS in 1972. The DoS is placed directly under the prime minister who administers policy decisions through the Space Commission. ISRO is central to India's space efforts. While this is an outcome of pooling of talent at a single source, it overshadows the role of other organisations in the decision loop. A case in point is the tradition of appointing the chairman of ISRO also as the secretary, DoS. Such an arrangement, while, on one the hand, contributes towards shortening the decision loop as well as efficient budgetary allocations, on the other, the puts a bias in allotment and prioritisation of projects. With the increasing role of private industry in space applications and space manufacturing, it would be prudent to segregate the overlapping roles of DoS and ISRO.

Military applications of space are presently undertaken by ISRO with a defence forces component contributing to the effort at the execution level. Agencies like DRDO, National Technical Research Organisation (NTRO) and Defence Image Processing and Analysis Centre (DIPAC) also have close liaison with ISRO for harnessing space applications. Such an arrangement may be sufficient for a limited space applications-based military utilisation of space. However, emerging issues like space situational awareness, space traffic management, debris avoidance, satellite defence and dependence on

Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) require a more active role for the armed forces. The organisation of India's space efforts, thus, needs to be more inclusive through an overlap between the DoS and MoD. This overlap can be optimally created by establishing a Military Space Command which has jurisdiction over all military space activities and is in sync with DoS and ISRO.

CONCLUSION

Military organisations worldwide have steadily increased reliance on space assets for various applications like communications, surveillance, navigation, meteorology and early warning. India's space capabilities are barely adequate to meet existing requirements for civilian space applications. The capacity for military space requirements is grossly inadequate considering the increasing reliance of military operations on space assets in an information-centric war-fighting environment.

Despite being a developing country, India has achieved the status of a space-faring nation, with its success in space ventures. Though the successes and milestones achieved are many, the missing punch is in the absence of defensive capability against deliberate attacks on space-based assets. The Indian space programme, though well defined, has yet to mature through a diversification of its ventures to encompass the entire spectrum of space capabilities. India has not favoured any dedicated military space assets and has had a remarkably peaceful orientation throughout its history of space ventures. However, the change in the space environment has put India in a dilemma.

Space is no longer a safe haven, and the space activities of many space-faring countries, including private players have demonstrated that freedom of operation in space would be a challenge in the coming years. The ASAT capabilities of potential adversaries, crowding of the space domain and the invisible threat of soft weapons needs to ring the alarm bells in India's Space Commission and Department of Space. What we get from space will ultimately depend on what we are looking for.

INDIA'S DRONE REGULATIONS-1.0: PROGRESS, POLICY GAPS AND FUTURE TRAJECTORY

R K NARANG

INTRODUCTION

Unmanned Aircraft (UA) are the future of aviation, and global aviation leaders have been developing enabling technologies and experimenting with regulatory options to facilitate integration of unmanned-manned aircraft operations. In the absence of International Civil Aviation Organisation (ICAO) standards for Remotely Piloted Aircraft Systems (RPAS) operations, many countries have formulated interim regulations to promote innovation and develop their civil-military applications. The Director General of Civil Aviation (DGCA), a regulatory body of India, published its first Civil Aviation Requirement (CAR) for the operation of civil RPAS on August 27, 2018, which is to become effective from December 1, 2018.¹ It also published the Do's and Don'ts² and Frequently Asked Questions (FAQs)³ to provide a ready reckoner to potential pilots, operators, users and the industry.

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1. "Requirements for Operation of Civil Remotely Piloted Aircraft Systems (RPAS)", Director General of Civil Aviation, Government of India, August 27, 2018, <http://dgca.nic.in/cars/D3X-X1.pdf>. Accessed on September 8, 2018.
2. "Do's and Don'ts Regarding Operations of RPAS", Director General of Civil Aviation, Government of India, August 27, 2018, <http://dgca.nic.in/cars/RPAS-Do's%20and%20Don'ts.pdf>. Accessed on September 8, 2018.
3. "FAQs Regarding Operations of RPAS", Director General of Civil Aviation, Government of India, August 27, 2018, <http://dgca.nic.in/cars/RPS-FAQs.pdf>. Accessed on September 8, 2018.

India has been late in initiating the formulation of the regulatory framework as many countries have already put in place empowering domestic regulations. The USA led the development of Unmanned Aerial Vehicles (UAVs) since World War II and took several policy initiatives.

The Minister of Civil Aviation of India, Shri Suresh Prabhu termed it as the Drone Regulations 1.0. A high-level task force set up in April 2018 has been studying various aspects of the formulation of the Drone Regulations and preparing a roadmap for optimum exploitation of UA technology. It is also tasked to formulate the next level of regulations, i.e. Drone Regulations 2:0.⁴ The follow-up CAR is expected to be a comprehensive one covering several complex issues that could not be included in the present CAR.

India has been late in initiating the formulation of the regulatory framework as many countries have already put in place empowering domestic regulations. The USA led the development of Unmanned Aerial Vehicles (UAVs) since World War II and took several policy initiatives, including the 'Vision-100 Century of Aviation Reauthorisation Act' in 2003, a policy on operations of Unmanned Aerial Systems (UAS) in July 2013⁵ and small UAS operations Rule (Part-107) in June 2016.⁶ Some of the other countries that formulated regulations for the operation of RPAS include Australia in 2002,⁷ European Union [Regulation (EC) No 216] in 2008⁸, and China, which formulated the Interim Provision for Light and Small

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4. "Government Announces Regulations for Drones", Press Information Bureau, Government of India, August 27, 2018, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=183093>. Accessed on September 21, 2018.
 5. "Unmanned Aircraft Systems (UAS) Operational Approval", July 30, 2013, http://www.faa.gov/documentlibrary/media/notice/n_89_00.227.pdf. Accessed on July 9, 2016.
 6. "Operations and Certification of Unmanned Systems, Part-107 to Title-14 of Code of Federal Regulations (CFR-14)", https://www.faa.gov/uas/media/RIN_2120-AJ60_Clean_Signed.pdf. Accessed on September 19, 2018.
 7. "Regulations of Drones: Australia", Library of Congress, <https://www.loc.gov/law/help/regulation-of-drones/australia.php>. Accessed on September 19, 2018.
 8. Regulation (EC) No 216/2008 of the European Parliament and of the Council, dated February 20, 2008, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02008R0216-20130129>. Accessed on June 10, 2016.

Unmanned Aircraft Operations in 2015⁹ and Regulations on Real-name Registration of Civil Unmanned Aerial Vehicles in May 2017.¹⁰ Most of these countries had allowed research and development activities well before they formally published their RPAS regulations.

The Indian RPAS manufacturing industry was led by defence research and manufacturing organisations, which initially struggled to find suitable partners in the civil industry. However, the situation changed in the last decade or so as several innovators and drone start-ups started manufacturing as well as providing RPAS service to military and industrial customers. On the regulatory front, the Indian industry was closely following the

development of RPAS regulations in other countries and looking forward to this CAR with an expectation that it would encourage research, development and manufacturing by the Indian industry, and enhance the commercial exploitation of UAVs in India. Also, the CAR was expected to provide technological solutions to expedite approvals and prevent corruption by having a single window online application and approval system.¹¹ One of the major apprehensions of the DGCA in allowing operation of RPAS in India was the near absence of research programmes to develop enabling

One of the major apprehensions of the DGCA in allowing operation of RPAS in India was the near absence of research programmes to develop enabling capabilities, non-availability of ground-based RPAS detection, identification and monitoring systems, airborne detect and avoid systems and counter RPAS systems to facilitate their safe operation in the Indian air space.

9. "Regulations of Drones: People's Republic of China", <https://www.loc.gov/law/help/regulation-of-drones/china.php>. Accessed on December 4, 2016.

10. Regulations on Real-name Registration of Civil Unmanned Aerial Vehicles Formally Issued by CAAC, Civil Aviation Administration of China, May 24, 2017, http://www.caac.gov.cn/en/XWZX/201705/t20170524_44222.html. Accessed on September 19, 2018.

11. There are different agencies for granting clearances for the issue of aviation licenses and flying permissions in India and the entire process of approvals lacked transparency. The approvals were delayed or denied on frivolous grounds, which was the major reason for corruption. There was hope that the proposed regulations would address these challenges by making all the approvals online through a single window.

capabilities, non-availability of ground-based RPAS detection, identification and monitoring systems, airborne detect and avoid systems and counter RPAS systems to facilitate their safe operation in the Indian air space.

The formulation of the CAR for the operation of civil RPAS by DGCA was a difficult task amid multiple views and technological challenges. This CAR provides the right beginning, even though it covers only operational aspects. It is the first, yet a significant step in providing much-needed legitimacy to civil RPAS operations in India, which remained banned since October 2014. However, whether this CAR meets the expectations of various stakeholders needs to be studied; therefore, this paper would deliberate on the following:

- To understand the process and challenges in the formulation of the policy (CAR).
- To examine its salient features, especially concerning registration, certification and operations.
- To examine the proposed regulatory provisions from the point of view of promoting manufacturing by the Indian companies.
- To examine the regulatory provisions for promoting research, design and development of futuristic unmanned aircraft technologies in India.
- To identify the challenges and expectations from Drone Regulations 2.0.

POLICY FORMULATION: PROCESS AND CHALLENGES

Indian companies were predominantly supplying RPAS and providing associated services mainly to the military, paramilitary forces and government agencies since the operation of civil RPAS had been banned by the DGCA in October 2014. The decision to ban the operation of civil RPAS was necessitated due to the threat of drone attacks by terrorists and RPAS collision with manned aircraft.¹² At that time, India did not possess the essential enabling technologies and regulatory mechanisms to allow RPAS operations in the country with the desired degree of safety. The DGCA was initially reluctant to formulate regulations for RPAS operations

12. Use of Unmanned Aerial Vehicle (UAV)/ Unmanned Aircraft Systems (UAS) for Civil Applications, DGCA, GoI, October 7, 2014, http://dgca.nic.in/public_notice/PN_UAS.pdf, Accessed on September 8, 2018.

due to non-availability of International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs). However, the SARPs were primarily meant to facilitate operations of RPAS in the international air space and ICAO had entrusted the responsibility of formulating regulations for RPAS operations in domestic air spaces of the member states to their civil aviation authorities. The reluctance was also due to the fact that the DGCA, unlike Federal Aviation Authority (FAA) of the USA and European Aviation Safety Agency (EASA) of the European Union, had not initiated research and development programmes to develop enabling technologies like RPAS detection, traffic monitoring and airborne detect and avoid systems, which were essential for safe operations of RPAS. However, the increasing demand of the Indian RPAS industry and unregulated operations of RPAS necessitated that the DGCA initiate the process of formulation of RPAS regulations.

The formulation of regulations for operations of RPAS was a complex process as the views and concerns of multiple agencies, including those placed under different ministries, had to be factored in, viz. Ministry of Home Affairs (MHA) for providing security clearance, Ministry of Defence (MoD) for air defence clearance, Airports Authority of India (AAI) for operations in the civil air space, Wireless Planning & Coordination (WPC) Wing of the Ministry of Communications for the allocation of frequency for RPA operations, Department of Industrial Policy and Promotion (DIPP) of the Ministry of Commerce and Industry for granting industrial licences to the manufacturers, and Directorate General of Foreign Trade (DGFT) for the import and export of drones.

After extensive deliberations, the first draft of the regulations was published in April 2016 for seeking inputs from the public.¹³ The inputs provided by the public comprised identification of deficiencies as well as suggestions for improving the draft regulations. After due deliberations and consultations with the relevant stakeholders, the DGCA published the

13. Guidelines for Obtaining Unique Identification Number (UIN) & Operation of Civil Unmanned Aircraft System (UAS), Director General of Civil Aviation, Government of India, April 20, 2016, [http://www.dgca.nic.in/misc/draft%20circular/AT_Circular%20-%20Civil_UAS\(Draft%20April%202016\).pdf](http://www.dgca.nic.in/misc/draft%20circular/AT_Circular%20-%20Civil_UAS(Draft%20April%202016).pdf). Accessed on September 8, 2018.

second draft of the regulations in November 2017.¹⁴ This draft had progressive provisions like earmarking of testing centres, etc. to promote indigenous Research and Development (R&D) of RPAS. However, it did not dwell on issues related to airworthiness certification of indigenously designed and manufactured RPAS, industrial licences to drone manufacturers in India and single window clearance for the UA pilot and Unmanned Aircraft Operator Permit (UAOP) licence. The draft received an overwhelming response from the public, RPAS manufacturers and operators. The Minister of State for Civil Aviation, Shri Jayant Sinha and his team in the Ministry of Civil Aviation took an active interest in seeking the feedback on the policy and conducted several workshops to take inputs from various stakeholders, including aviation experts, academia, drone manufacturers, digitisation experts, etc. As a result, several pertinent issues were flagged during the consultation process.

TASK FORCE ON DRONE REGULATIONS

The Ministry of Civil Aviation's (MoCA's) consultation with various stakeholders as well as feedback from the public highlighted some of the critical deficiencies that were left unattended in the draft RPAS regulations of November 2017. These interactions also brought to the fore the lack of expertise and preparedness of MoCA to deal with more serious issues like airworthiness certification of RPAS, the absence of research programmes to develop futuristic air traffic control systems, detect and avoid systems and other enabling technologies to propose a futuristic Unmanned Traffic Management (UTM) system. Also, a need was felt for including provisions that would support the 'Make in India' initiative of the government. Therefore, MoCA formed a 13-member Task Force under the chairpersonship of the minister of state for civil aviation in April 2018. The high-powered committee had members from the relevant ministries, R&D organisations, academia, etc. It also included 20 special invitees comprising representatives from

14. Requirements for Operation of Civil Remotely Piloted Aircraft System (RPAS), Director General of Civil Aviation, Government of India, November 1, 2017, [http://www.dgca.nic.in/misc/draft%20cars/CAR%20-%20UAS%20\(Draft_Nov2017\).pdf](http://www.dgca.nic.in/misc/draft%20cars/CAR%20-%20UAS%20(Draft_Nov2017).pdf). Accessed on September 8, 2018.

domestic and international industry experts, academia and individuals. The terms of references of the task force covered a wide variety of issues, including some of the critical ones that were often overlooked in the past. These included:

- research and development;
- acquisition and commercialisation;
- regulatory framework;
- development of the industry;
- preference for 'Make in India'; and
- potential impact on the industry, job creation, investments, contribution to the economy, exports, technology infusion, integration with value chains, etc.

The committee was required to submit its recommendations within six months.¹⁵

DRONE REGULATIONS 1.0: PROGRESS AND POLICY GAPS

The Ministry of Civil Aviation published the regulations for operations of civil RPAS (Drone Regulations 1.0) on August 27, 2018, even though the final report of the task force for formulating the drone regulations was awaited.¹⁶ The Drone Regulations 1.0 supersedes the DGCA notification of October 2014, which imposed the ban on the operation of civil RPAS.¹⁷ The new policy stipulates one-time registration of drones, pilots and owners and allows individual Indian citizens, companies or registered bodies to fly RPAS for civil applications. Some of the key features and limitations

15. Constitution of task force for formulating a roadmap with implementable recommendations for the government, industry and research institutions to leverage the Unmanned Aerial Vehicle (UAV) technology. Ministry of Civil Aviation, Government of India, April 11, 2018, http://www.civilaviation.gov.in/sites/default/files/Constitution%20of%20Task%20Force%20for%20UAVs_1.pdf.

16. Requirements for Operation of Civil Remotely Piloted Aircraft System (RPAS), Director General of Civil Aviation, Government of India, August 27, 2018, <http://dgca.nic.in/cars/D3X-X1.pdf>. Accessed on September 8, 2018.

17. Use of Unmanned Aerial Vehicle (UAV)/ Unmanned Aircraft Systems (UAS) for Civil Applications, DGCA, GoI, October 7, 2014, http://dgca.nic.in/public_notice/PN_UAS.pdf, Accessed on September 8, 2018.

The introduction of the automatic app-based permission through the Digital Sky platform is the first – and a progressive – step towards developing a futuristic unmanned air traffic control system in India, which needs to be developed further. The digitisation of the approval process and nomination of colour zones would simplify the process of approvals as well as reduce the workload of air traffic control centres.

of Drone Regulations 1.0 are deliberated on below.

DIGITAL SKY: NOT YET A SINGLE WINDOW APPROVAL SYSTEM

One of the major challenges faced by the unmanned aircraft industry had been the difficulty in obtaining clearances from multiple agencies and their lack of transparency and accountability in granting approvals and clearances. The Digital Sky programme announced in November 2017 aims to digitise approvals, the filing of the flight plan and provide a technological solution for establishing connectivity between the low flying RPA, air traffic controllers and ground radars for real-time monitoring of the RPAS flights.¹⁸ The Digital Sky platform has app-based permission software with a 'No Permission, No Take-Off' option as a safety feature. A Subscriber Identity Module (SIM) would be installed on each RPA, and no RPA would be able to take off unless app-based permission is uploaded on it.

Another feature of the digital sky platform is earmarking of the three colour zones, with the 'red zone' being the area in which flying is not permitted, the 'yellow zone' for controlled air space in which permission is required for flying and the 'green zone' for uncontrolled air space in which no permission would be required for operation. The introduction of the automatic app-based permission through the Digital Sky platform is the first – and a progressive – step towards developing a futuristic unmanned air traffic control system in India, which needs to be developed further. The digitisation

18. "Jayant Sinha Pitches for 'Digital Sky' for Drones", *The Economic Times*, November 22, 2017, <https://economictimes.indiatimes.com/industry/transportation/airlines-/-aviation/jayant-sinha-pitches-for-digital-sky-for-drones/articleshow/61755831.cms>.

of the approval process and nomination of colour zones would simplify the process of approvals as well as reduce the workload of air traffic control centres. A cue could be taken from China where its Civil Aviation Administration is exploring the feasibility of using a cloud-based system for real-time monitoring of RPA movements. It published a study in January 2018 about the feasibility and effectiveness of utilising cellular networks for the supervision of drones.¹⁹ MoCA could study the system and identify relevant aspects for incorporation in its Digital Sky platform.

The introduction of the 'Digital Sky' platform for drone operations has raised the hope that it would provide all the registrations, approvals and permissions through a single window.

UIN and UAOP Approvals: The Indian Foreign Service's passport department was earlier known to have a cumbersome, non-transparent and corrupt system in issuing passports. However, it overcame these ills through digitisation and demonstrated the efficacy of having a single window clearance system requiring approvals from multiple departments within the same ministry as well as from multiple ministries. The introduction of the 'Digital Sky' platform for drone operations has raised the hope that it would provide all the registrations, approvals and permissions through a single window. The Digital Sky platform has made a promising start with the introduction of the online system for the filing of the application for obtaining the Unique Identification Number (UIN) and Unmanned Aircraft Operator (UAOP) (para 6.2.3, para 6.3 and para 7.3). The laying down of timelines for the issue of UIN and UAOP in two and seven days respectively is another forward-looking step, which would bring accountability among the issuing departments. This platform would also ease the workload of civil RPA operators as they would not be required to physically file the flight plans. On the other hand, digitisation of the process would relieve the air traffic controllers from physically ascertaining the correctness of the routing

19. Low Altitude Connected Drone Flight Safety Test Report, Civil Aviation Administration of China, January 31, 2018, <http://www.caac.gov.cn/en/HYYJ/NDBG/201802/P020180227616856973062.pdf>. Accessed on September 23, 2018.

and avoidance of restricted and prohibited areas during the proposed RPAS operation, which would reduce the chances of mistakes due to human error as well as the time required for granting approvals. The Digital Sky platform, however, does not provide single window clearance for UIN and UAOP as the applicant is required to submit Equipment Type Approval (ETA) from the Wireless Planning and Coordination (WPC) wing of the Ministry of Telecommunication for operating in the de-licensed frequency band (s), security clearance from the MHA and security programme by the Bureau of Civil Aviation Security (BCAS), which is a department in the Ministry of Civil Aviation.

Permission for Operations: Another aspect in which the Digital Sky platform does not achieve its purpose of single window clearances is the obtaining of permission for flying operations. The operator is required to obtain permission through the “Digital Sky” platform (as per para 12.4 of the CAR) as well as file the flight plan at least 24 hours before actual operations. Also, he would be required to obtain a separate Air Traffic Control (ATC) briefing, meteorological briefing and ATC clearance from the nearest ATC unit, Air Defence Clearance (ADC) from the nearest Indian Air Force (IAF) unit and flight information clearance from the Flight Information Centre (FIC) concerned (as per para 12.5 of the CAR). As discussed earlier, the Digital Sky platform would provide online clearance for operations in different colour zones. It is understood that clearances from all the above agencies would also be needed for operations in the yellow zone; however, it is not clear whether RPAS operating in the green zone would also need to take briefings/approvals from all these agencies. The need for the manual filing of the flight plan and a minimum period of 24 hours before the actual flight could restrict the operators from undertaking operations at short notice or make changes to the planned route due to operational necessity despite having a Digital Sky platform. This could become a hindrance in optimally exploiting the potential of RPAS. It should be feasible to do away with the requirement of physical filing of the flight plan, obtaining of ADC and FIC with the operationalisation of the Digital Sky platform.

DOES THE POLICY FAVOUR DOMESTIC RPAS MANUFACTURERS?

Shri Suresh Prabhu made an ambitious statement on August 27, 2018, when he said, "Today, we start an exciting new chapter in India's aviation history by allowing commercial use of drones. I am sure that many new and exciting applications will emerge that will propel India's economy forward. Our progressive regulations will encourage a vast 'Make in India' drone industry."²⁰ Before we understand the implications for the 'Make in India' initiative, it is pertinent to understand various stakeholders and their significance in bringing technology, job creation and strengthening the economy in the long run under this scheme. The 'Make in India' initiative in the drone industry has two significant elements, viz. 'Make in India' by foreign Original Equipment Manufacturers (OEMs) and 'Make in India' by Indian manufacturers. It is the second category, which invariably loses out if the 'Make in India' initiative is not implemented correctly. Indian drone manufacturers or drone service providers either procure complete drone or major assemblies, predominantly from Chinese or Taiwanese manufacturers. Also, India does not produce critical parts like batteries, chips, propellers and semi-conductors. In the last decade, Indian companies have gained enough expertise in the integration of drones and the opening up of the civil RPA industry provides a golden opportunity for the Indian RPA manufacturing entities to expand their business and move towards increasing the indigenised contents during their manufacturing in India. Indian UAV manufacturing companies are small when compared to the Chinese, American and Israeli civil UAV manufacturing companies and they would not be able to compete with them if the regulatory mechanism does not support them. The growth of the domestic manufacturing industry in any part of the world has always been made possible due to the hand-holding of the government and through enabling regulatory policies. This is a critical juncture in the history of the RPAS manufacturing industry of India and if enabling regulatory provisions are formulated, Indian manufacturing

20. "Government Announces Regulations for Drones", Press Information Bureau, Government of India, August 27, 2018, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=183093>. Accessed on September 21, 2018.

companies would soon be able to manufacture critical components within India, reduce dependence on imports, and create jobs.

The CAR, in its present form, favours Indian operators by allowing operations of imported, domestically purchased (and not produced as per para 5.2 of the CAR) and leased RPAS; however, it does not have enabling, provisions to promote manufacturing by Indian companies. The 'Make in India' initiative in the defence and military aviation domains has not strengthened the domestic aviation manufacturing industry. Most 'Make in India' initiatives by the foreign OEMs became 'Assemble in India' with little or negligible transfer of technology, which directly or indirectly has had an adverse impact on the indigenous aviation manufacturing industry, especially the ones involved in the core technology sectors. Indian drone manufacturers too could face the same fate. There is a need to draw a line between participating in the 'Make in India' initiative by foreign companies and manufacturing by Indian companies and thereby provide an incentive to Indian manufacturers. The job creation by foreign companies, by and large, is akin to the creation of the services sector with a low level of technological gains in manufacturing technologies.

The silver lining for the Indian civil aviation manufacturing industry lies in the terms of reference of the high powered committee which includes "Preference for 'Make in India', development of the industry and the potential impact on industry, job creation, investments, contribution to economy, exports, technology infusion, integration with value chains, etc." The need for 'Make in India' is understood, but care must be taken to ensure that Indian manufacturers are given preference, and in no case, should they be at a disadvantage vis-à-vis foreign OEMs.

The drone manufacturing industry has provided India with an opportunity to make a course correction by supporting Indian manufacturers, which India missed out in the civil aviation manufacturing sector. India never pursued civil aviation manufacturing aggressively, citing lack of economic viability for such endeavours. However, no nation can reduce imports and increase the indigenous manufacturing capability by this argument. China

did not buy this argument, and it has started reaping the benefits and, thus, is emerging as a leading manufacturer in aviation and other technologies. It is also argued that the ability of China to promote domestic manufacturing and acquire technology is attributed to the Communist form of government, firm political control and coherent policies, which cannot be replicated by India. However, this argument also does not stand scrutiny when we compare India's achievements in the space and atomic energy sectors in which India has succeeded despite having limitations of a democratic government. It has been seen that whenever the Indian leadership decided to pursue 'Make in India' wholeheartedly, it was able to find ways and means of making it happen. India should grab the opportunity offered by Indian start-ups and RPA manufacturers so that they get preference where feasible or at least a level playing field to promote manufacturing in India.

Licensing for Indian Manufacturers: UAVs, RPAS and autonomous, programmable aerial vehicles fall under the defence items, which require permission from the Department of Defence Production, Ministry of Defence, for obtaining an industrial licence from the Department of Industrial Policy and Promotion (DIPP). The security guidelines stipulated by the Ministry of Defence²¹ impose an additional financial burden on Indian UAV manufacturers while Indian companies importing UAVs from foreign vendors do not have to comply with such security guidelines, which adversely impacts the economic viability of UAVs manufactured by Indian companies in India.²² Also, RPAS manufactured by foreign OEMs may have inbuilt cyber vulnerabilities, which could be exploited by manufacturers, criminals and terrorists. In one such move, the US military banned the use of Chinese DJI RPAS in 2017, citing increased awareness of cyber vulnerabilities.²³ Therefore, imported RPAS could

21. Industrial Licensing Policy in Defence Sector, Make in India, Indian Army, <https://indianarmy.nic.in/MakeInIndia/Site/FormTemplate/frmTempSimpleMII.aspx?MnId=06r6xXCLx5QiT+hi2IHCPA==&ParentID=7x+DFbjq9eyTNbY2WJq7w==>. Accessed on September 23, 2018.

22. List of defence items requiring industrial licence, Department of Industrial Policy and Promotion, Government of India, June 26, 2014, http://dipp.nic.in/sites/default/files/pn3_2014_0.pdf. Accessed on September 23, 2018.

23. Jeff Daniels, "US Army Reportedly Bans Chinese-Made Drone, Citing 'Cyber Vulnerabilities'", *CNBC*, August 4, 2017, <https://www.cnbc.com/2017/08/04/us-army-bans-chinese-made-drone-citing-cyber-vulnerabilities.html>. Accessed on November 10, 2018.

In recent years, it has been observed that Indian start-ups and manufacturers have reached a level of expertise in several domains, and if given additional time and opportunity, their products could match and compete with global rivals.

be brought under the defence items category and corresponding security guidelines could be applied to them to place both of them on a common platform. Alternatively, a separate licensing criterion or simplified mechanism for the issue of the industrial licence to civil RPA manufacturers could be laid down. Also, special security measures could be instituted to counter the cyber vulnerabilities posed by imported RPAS.

Empowering Domestic Manufacturers:

The Indian RPAS manufacturing industry is at a disadvantage while competing with international companies when Indian government agencies procure RPAS through global tenders. The Indian RPA manufacturing industry is still evolving and has a small market. It also has to face the uncertainty of the demand-supply mechanism in India. When a Request for Proposal (RFP) is issued by the MoD, para-military forces, government departments or ministries, there is hardly any time for the Indian start-ups and RPA manufacturing companies to develop, optimise, modify or upgrade their products to meet the standards or capabilities being offered by established global players. In recent years, it has been observed that Indian start-ups and manufacturers have reached a level of expertise in several domains, and if given additional time and opportunity, their products could match and compete with global rivals.

Balance the GST and Import Taxes: Another impediment in promoting manufacturing by Indian companies has been incoherence in our tax structure, which directly or indirectly favours import or assembly of products by foreign manufacturers. A case in point is the Indian aviation (manned aircraft) Maintenance and Repair Organisation (MRO) industry, which pays 18 percent Goods and Services Tax (GST) on services and spare parts for services rendered in India, while foreign MRO service providers directly

import replacement engines and spare parts under Chapter 88 of the Central Board of Indirect Taxes (CBIT), which are charged at 5 percent GST. The situation for the RPAS manufacturers and importers is likely to be similar as soon as Indian manufacturers start paying GST on indigenously produced RPAS and their MRO services vis-à-vis assembled RPAS or foreign MROs. The task force should look into the aspect of balancing the GST and import tax to provide a level playing field to Indian RPAS manufacturers.

**AIRWORTHINESS CERTIFICATION:
A MUST FOR SAFE OPERATIONS**

The increasing employment of RPAS for various civil-industrial applications necessitates that standards are set for airworthiness²⁴ to ensure that RPAS are reliable, their command and control links are secure and they do not pose a danger to other manned and unmanned aircraft. A study by the Civil Aviation Administration of China highlighted that civil RPAS were vulnerable to tampering of Global Positioning System (GPS) data, simulation of false GPS signals, disruption of the data-link between RPAS and the ground control station and interference in the drone operating software (similar to the digital sky platform, thereby making it deviate from the intended path). These breaches in datalinks and GPS signals, being crucial for the safe operation of RPAS, pose greater security hazards than manned aircraft. Therefore, the datalinks and GPS being employed for civil RPAS need to have a higher level of security regarding encryption and redundancy. The study also highlighted the *modus operandi* of some of the dubious companies in selling anti-fence features to enable the drone to bypass the electronic

A study by the Civil Aviation Administration of China highlighted that civil RPAS were vulnerable to tampering of Global Positioning System (GPS) data, simulation of false GPS signals, disruption of the data-link between RPAS and the ground control station and interference in the drone operating software.

24. P-13, Remotely Piloted Aircraft Systems (RAS) Concept of Operations (CONOPS) for International IFR Operations, International Civil Aviation Organisation (ICAO), <https://www.icao.int/safety/UA/Documents/RPAS%20CONOPS.pdf>. Accessed on September 25, 2018.

fence to deviate from the approved route. The anti-fence features could help criminals, terrorists and adversaries breach or bypass the electronic security fence, which could facilitate intrusion of rogue RPAS into prohibited and restricted areas or create a collision hazard for the civil aviation traffic without showing the breach on the RPAS traffic monitoring system. The RPA manufacturers, on the other hand, upgraded GPS with added security features at an additional cost.²⁵ The study highlighted the need for finding technological solutions, strengthening the drone regulations and setting up a drone standards system for safe operation of RPAS.

India has its challenges in formulating RPA standards and their certification. Within the MoCA, DGCA views itself as the agency responsible for facilitating the operations of RPAS and would not like to pursue the formulation of CAR on airworthiness certification of RPAS, which fall within the purview of the airworthiness directorate of MoCA. There is a gap in the competence of the airworthiness officers of the airworthiness directorate of the DGCA vis-a-vis those of the FAA and EASA²⁶ and there was reluctance in the DGCA to proactively certify RPAS manufactured in India, which is still an evolving technology. Drone Regulations 1.0 has steered away from the aspect of airworthiness certification of RPAS; however, it has stipulated certain minimum standards for RPAS for issuing the UIN. The formulation of standards would bring some sort of standardisation in the locally purchased as well as imported RPAS. Also, standards, like detect and avoid systems, appear to be difficult to implement considering the current level of technology and research being undertaken within the country and at global levels. Therefore, there is a need to review existing standards, broaden the scope and include airworthiness certification of RPAS in the Drone Regulations 2.0 to promote RPAS manufacturing and ensure their safe operations in India.

25. Low Altitude Connected Drone Flight Safety Test Report, Civil Aviation Administration of China, January 31, 2018, <http://www.caac.gov.cn/en/HYYJ/NDBG/201802/P020180227616856973062.pdf>. Accessed on September 23, 2018.

26. One Hundred Sixty-Eighth Report of the Parliamentary Standing Committee on Transport, Tourism and Culture on the Director General of Civil Aviation (DGCA), Issues and Challenges, May 2011, <http://164.100.47.5/newcommittee/reports/EnglishCommittees/Committee%20on%20Transport,%20Tourism%20and%20Culture/168.pdf>. Accessed on October 1, 2018.

RESEARCH AND DEVELOPMENT

The world is witnessing the emergence of futuristic unmanned aircraft technologies (e.g. artificial intelligence, automation in UAVs, UAV swarms) which are going to transform the trajectory of the aviation business in the future. Some of these technologies are being developed in our neighbourhood (especially China) almost in similar timelines as global leaders, which would make it challenging for the Indian companies to compete in the international market. Also, India has lagged in initiating measures to integrate unmanned aircraft in the civil air space. The DGCA has not involved itself in the research and development of air traffic management technologies and other enabling technologies to facilitate the integration of RPAS operations in the civil airspace.

The DGCA CAR as of now, limits operations of RPAS to the line of sight distances by day only while many countries have formulated regulations to promote the development of new capabilities and applications of the RPAS. Australia has formulated regulations for allowing night operations by RPAS,²⁷ China allowed testing of swarms of over 1,000 UAVs in February 2017²⁸ and passenger taxi Ehang-184 in February 2018,²⁹ while Canada initiated beyond the line of sight operation trials in June 2018.³⁰

The futuristic Universal Transverse Mercator (UTM) systems are moving from accommodating RPAS in the segregated air space to integrating their operations in the non-segregated air space.³¹ Their procedure and regulation should enable operation of RPAS in Instrument Flight Rules (IFR), Beyond Visual Line of Sight (BVLOS), logistics supply and passenger carrier

27. "Operation of RPAS by Night", Civil Aviation and Safety Authority of Australia, <https://www.casa.gov.au/standard-page/operation-rpa-night>. Accessed on September 22, 2018.

28. "First Test Footage Revealed of Ehang 184 Manned Passenger Drone, *Ehang*" February 11, 2017, <http://www.ehang.com/formation/>. Accessed on September 22, 2018.

29. Ibid.

30. "Transport Canada Selects Four Organizations for BVLOS Drone Trials, Inside Unmanned Systems", June 18, 2018, <http://insideunmannedsystems.com/transport-canada-selects-four-organizations-for-bvlos-drone-trials/>, September 22, 2018.

31. "ICAO Secretary General Stresses Safe and Harmonized Airspace Management Priorities for Unmanned Aircraft and Drones", International Civil Aviation Organisation (ICAO), September 18, 2018, <https://www.icao.int/Newsroom/Pages/ICAO-Secretary-General-stresses-safe-and-harmonized-airspace-management-priorities-for-unmanned-aircraft-and-drones.aspx>. Accessed on September 25, 2018.

The operation of civil RPAS would increase the air traffic and make the civil air space congested. Therefore, reliable traffic detection, identification and traffic management systems are needed to ensure the seamless operation of the manned and unmanned aircraft.

operations by day as well as by night.³² If India wants to evolve the culture of innovation and technology development, it would need to incorporate enabling regulatory provisions in its next drone regulations (Drone Regulations 2.0), which facilitate research, development, testing and manufacturing of futuristic technologies in India.

Flight Testing Sites: Flight testing facilities are essential for promoting indigenous research and development of cutting-edge technologies in the country. The US has earmarked six UAS testing sites³³ and similar facilities are provided by other nations developing innovative unmanned aircraft and associated technologies. In India, for the first time in the history of aviation regulatory mechanisms, the earmarking of the flight-testing sites was proposed in the draft CAR of November 2017 to promote participation of the private sector and individuals in developing innovative unmanned aircraft technologies. However, these were not included in the final circular. Section 6.4 of this CAR exempts RPAS flying in enclosed premises for research and development from obtaining UIN; however, there is no provision for allowing testing of innovative UAVs outside closed premises, which is essential for developing futuristic capabilities and long-range RPAS. The proposed provision can hardly be an encouragement for the Indian RPA companies involved in R&D. MoCA needs to earmark research and testing sites and formulate enabling regulations to promote R&D and encourage the design and development of aviation technologies in the country.

Developing Enabling Technologies and Capabilities: Section 11.2 of the CAR mandates that RPAS above the category of micro RPAS flying up to

32. Remotely Piloted Aircraft Systems (RAS) Concept of Operations (CONOPS) for International IFR Operations, International Civil Aviation Organisation (ICAO), <https://www.icao.int/safety/UA/Documents/RPAS%20CONOPS.pdf>. Accessed on September 25, 2018.

33. "UAS Test Sites", Federal Aviation Authority, United States Department of Transportation, https://www.faa.gov/uas/research/test_sites/. Accessed on September 21, 2018.

400 ft be equipped with the SSR transponder or ADS-B and detect and avoid capability. However, there is no known programme to develop airborne detect and avoid systems in India. Also, most of the equipment being developed globally is in the testing and validation phase and it would be difficult to find lightweight miniaturised versions, especially for the micro and mini category of RPAS, which will make it difficult to comply with these requirements. Another aspect, which needs attention is the non-availability of the voice and data recording system in the RPA, which would make it difficult to carry out post-accident analysis, as is being done in manned aircraft. Such a system would be essential for RPAS placed in the large category.

The Indian police and internal security agencies are concerned that operation of civil RPAS would create new law and order challenges for them as RPAS with an ability to carry different payloads could intrude into the private space of citizens and enable anti-social elements and criminals to execute crimes.

The operation of civil RPAS would increase the air traffic and make the civil air space congested. Therefore, reliable traffic detection, identification and traffic management systems are needed to ensure the seamless operation of the manned and unmanned aircraft. However, there is no known programme, other than Digital Sky platform, to develop ground radars and futuristic unmanned air traffic management systems in India; this would make the job of traffic monitoring and ensuring the simultaneous operation of RPAS and manned aircraft in the non-segregated air space extremely difficult.

SECURITY THREATS AND COUNTER-MEASURES

Law and Order Issues: The Indian police and internal security agencies are concerned that operation of civil RPAS would create new law and order challenges for them as RPAS with an ability to carry different payloads could intrude into the private space of citizens and enable anti-social elements

and criminals to execute crimes. The US government witnessed increasing employment of drones to supply phones, SIM cards, sharp weapons, drugs into prisons, jails and juvenile homes, which forced it to pass legislation in September 2018 to deter and punish people for unauthorised transportation of drugs, weapons, other contraband items. The utilisation of commercial drones for criminal activities necessitated that the police department hire drone pilots and procure anti-drone systems to prevent such activities.³⁴

Security Threats: The security agencies are also concerned about the possibility of terrorists employing civil RPAS for executing terror attacks. There was a mass attack by armed UAVs on two Russian military positions in Syria, which consisted of an attack by three small armed UAVs on the Tartus Naval Station and by 10 UAVs at the Khmeimim Air Base on the night of January 5-6, 2018. It was the first mass attack on military installations.³⁵ In another incident, an unsuccessful attempt was made to assassinate Venezuelan President Nicolas Maduro during a military parade when he was attacked by Improvised Explosive Device (IED) equipped quadcopter drones on August 4, 2018.³⁶ The capability to undertake collaborative operations took a giant leap with the successful trials of UAV swarms in the US and China, which indicates a substantial enhancement in the potential and scope of such attacks in the future.

Counter UAV Systems: The non-availability of systems to detect, identify, track and neutralise UAVs has been a major concern for the security agencies. It is feasible to launch small UAVs from anywhere in varying numbers, which can fly at very low levels towards their intended target. Most of the existing surveillance systems are not suitable for detecting them, ascertaining their identity and numbers, or ensuring continuous tracking. Even if a rogue

34. "California Outlaws Drone Flights Over Prisons", *State Scoop*, September 12, 2018, <https://statescoop.com/california-outlaws-drone-flights-over-prisons>. Accessed on September 23, 2018.

35. Jeremy Binnie, "Russians Reveal Details of UAV Swarm Attacks on Syrian Bases", January 12, 2018, *Janes 360*, <https://www.janes.com/article/77013/russians-reveal-details-of-uav-swarm-attacks-on-syrian-bases>. Accessed on September 23, 2018.

36. Anna Vanessa Herrero and Nicholas Casey, "Venezuelan President Targeted by Drone Attack, Officials Say", *The New York Times*, August 4, 2018, <https://www.nytimes.com/2018/08/04/world/americas/venezuelan-president-targeted-in-attack-attempt-minister-says.html>. Accessed on September 23, 2018.

UAV is identified and tracked, the next challenge lies in finding a suitable system which is light, portable, can be launched at short notice and counter the threat of rogue UAVs with a reasonable level of certainty. This is a concern in the MoCA and it had invited companies developing counter UAV technologies for a demonstration of their capabilities in February 2018.³⁷ The DRDO has also developed a one KW anti-UAV laser system, which is carried on a truck and has a range of one kilometre. It has a plan for developing more powerful lasers.³⁸ There is a need to make counter UAV systems lightweight, enhance their range and increase their effectiveness for ease of employability. Many countries are experimenting with different systems, and most of such equipment is still in the development stage.

DRONE REGULATIONS-2.0: FUTURE TRAJECTORY OF DRONE REGULATIONS

India's civil aviation minister, while releasing the Drone Regulations 1.0, had stated, "We want to establish a world-leading drone ecosystem. These regulations firmly place us among the global leaders. Our policy roadmap will certainly provide a strong impetus to all players in the drone ecosystem. We hope that these initiatives will enable us to create a vibrant new industry."³⁹ The release of Drone Regulations 1.0, along with the formation of a high-level committee, has provided a perfect launching pad for developing futuristic drone regulations in the country. The development of the Digital Sky platform indicates an out-of-the-box approach and fresh thinking of the MoCA. India's nascent drone industry holds a lot of promise, which provides an opportunity to

37. "Assessment and Formulation of Requirements for Counter Drone Technologies for Surveillance, Detection and Neutralization of Drones/ UAVs in the Vicinity of Airports", Ministry of Civil Aviation, <http://www.civilaviation.gov.in/sites/default/files/Public%20Notice%20reg%20live%20demo%20in%20March-extension.pdf>. Accessed on September 22, 2018.

38. Shaurya Karanbir Gurung, "India Gets a Step Closer to Laser Weaponry as DRDO Successfully Tests Laser System", *The Economic Times*, July 14, 2018, <https://economictimes.indiatimes.com/news/defence/india-gets-a-step-closer-to-laser-weaponry-as-drdo-successfully-tests-laser-system/articleshow/61954646.cms>. Accessed on September 22, 2018.

39. "Government Announces Regulations for Drones", Press Information Bureau, Government of India, August 27, 2018, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=183093>. Accessed on September 21, 2018.

The tax structure should be favourable for Indian manufacturers as well as Indian entities providing Maintenance, Repair and Overhaul (MRO) services in India and at no stage, should it be unfavourable to Indian entities.

correct the past mistakes of ignoring the civil aviation manufacturing sector. The response of the industry and other stakeholders to the Drone Regulations 1.0 has been positive. Also, they are aware that the high-level task force on drone regulations headed by the minister of state for civil aviation is studying various options to develop a futuristic regulatory framework. This has also raised the expectations from the second edition of the drone regulations, which is expected to be released after the report of the task force and feedback on the CAR is received. The

issues, which need to be addressed by the Drone Regulations 2.0 are summed up as follows:

- **Single Window Clearances:** Single window online application for the issue of UIN and UAOP involving approvals from all the stakeholders, including WPC, MHA, BCAS and DGCA.
- Single window application for granting permission from the Digital Sky platform, ATC and meteorology briefing, and for issuing ADC and FIC.
- **Standards and Airworthiness Certification:** Formulation of standards for the airworthiness of RPAS and UAVs and nomination of the agency to certify them. Efforts should be made to formulate standards that include measures to strengthen command and control data links, improve the reliability of RPAS, reduce the accident rate, lay down guidelines to prevent GPS failures as well as introduce alternate safety systems to cater to the eventuality of GPS failure. Also, the Indian Regional Navigation Satellite System (IRNSS) or Navic receiver could be made mandatory for RPAS operating in the Indian air space.
- **Voice and Data Recorders:** Making it mandatory for the larger UAVs (at least for RPAS weighing more than 150kg) to have onboard voice and data recording system for effective post-accident analysis.

- **Industrial Licence:** The conditions for the issue of the industrial licence for civil RPAS manufacturers need to be revised and, if required, issue of industrial licences to civil manufacturers to be removed from the list of defence items. This will ensure that Indian manufacturers are provided a level playing field vis-à-vis foreign companies as well as those Indian companies which import products from foreign OEMs.
 - **Tax Structure:** A study of the GST and taxes levied by the Central Board of Indirect Taxes (CBIT) on imported products and spares. The tax structure should be favourable for Indian manufacturers as well as Indian entities providing Maintenance, Repair and Overhaul (MRO) services in India and at no stage, should it be unfavourable to Indian entities.
 - **Promoting Indigenous Manufacturing:** Indian companies should be provided the opportunity to develop products indigenously. This can be done by allowing Indian companies additional time after the RFI/RFP to develop, modify or upgrade their products before the field trials to match global players.
 - **RPAS Testing Sites:** Indian private sector entities are raring to have a go at the civil-military RPAS technologies; however, they need an enabling regulatory and operational environment. Earmarking of the RPAS testing sites and transparent policy on utilisation can be a revolutionary measure, which will enable the private sector entities to compete with global players and help the nation in securing advanced and innovative equipment and associated technologies.
 - **Research and Development:** The capabilities of RPAS are expanding into domains like beyond visual line of sight operations, night operations, unmanned taxis, logistics supplies, etc. However, RPAS operations
- The Indian drone manufacturing industry holds a lot of promise; however, it needs the support of the government and an enabling regulatory mechanism to prosper. Indian drone manufacturers, innovators, and operators need to be provided incentives**

should not jeopardise the safety of people, vital installations and other aircraft in the air. This requires continuous research to design and develop enabling systems and capabilities. Therefore, RPAS regulations must have favourable provisions to promote research and development of cutting-edge and futuristic technologies.

- There is an urgent need to initiate research to develop enabling technologies like airborne detect and avoid systems, ground-based RPAS detection, identification, tracking and control systems to facilitate the integration of manned and unmanned aircraft operations, which need to be led by the MoCA.
- Research is also needed to develop counter RPAS technologies to provide protection against rogue RPAS.

CONCLUSION

The Drone Regulations 1.0 comprise a small but significant step towards facilitating the exploitation of drones for commercial applications. However, for creating a world-class drone eco-system, this CAR would need to be followed up by a comprehensive and robust regulatory and policy framework, which focusses on promoting research and development, promotes manufacturing by Indian drone companies and encourages foreign companies to collaborate with Indian entities to set up design and manufacturing facilities in India in such a way that it makes India a manufacturing hub and not an assembly point.

India's next generation drone regulations, i.e. Drone Regulations 2.0 must address critical issues like formulation of standards for airworthiness, setting up of processes, procedures and institutional mechanisms for certification of domestically designed and produced RPAS, providing single window clearances and approvals through digital platforms, providing enabling infrastructure and regulatory mechanism for research, design and innovation, having favourable taxation systems for encouraging design and manufacturing in India and discouraging import. The policies should

provide an edge to the products manufactured by Indian manufacturers over the ones imported from foreign OEMs.

The Indian drone manufacturing industry holds a lot of promise; however, it needs the support of the government and an enabling regulatory mechanism to prosper. Indian drone manufacturers, innovators, and operators need to be provided incentives on the lines of the ones provided under the regional connectivity scheme to develop airfields in smaller cities under the National Civil Aviation Policy 2016.⁴⁰ Indian RPAS manufacturers need hand-holding by the government to make India a UAV manufacturing hub.

The Indian civil aviation manufacturing industry is non-existent, as almost the entire fleet of civil aircraft being utilised by commercial airlines, air logistics and air charter services providers is imported or leased from foreign manufacturers. Will Drone Regulations 2.0 help the Indian RPAS manufacturing industry overcome the limitations of the civil aviation manufacturing industry? Will it be able to promote RPAS design, development and manufacturing in India? The answer to all these questions will only be known after it is released and implemented.

40. National Civil Aviation Policy, 2016: Salient Features, Ministry of Civil Aviation, Government of India, June 15, 2016, <http://pib.nic.in/newsite/PrintRelease.aspx?relid=146238>.

AMERICAN DRONE ATTACKS IN YEMEN: AN ANALYSIS

DIPANWITA CHAKRAVORTTY

THE BEGINNING

Yemen's tryst with American drone attacks began in the year 2000 when the USS *Cole* was bombed on October 12. The USS *Cole* was a United States Navy guided-missile destroyer and was docked in the Aden harbour during the attack. Around 17 American sailors were killed and 39 injured during the attack. It was believed that an Al Qaeda operative named Qaed Salim Sinan al-Harethi was the mastermind behind the attack.¹ He was a citizen of Yemen but was trained by Al Qaeda in Saudi Arabia. The porous border between Yemen and Saudi Arabia helped Al Qaeda flourish in this region.

After 9/11 and the subsequent declaration of the War on Terror by the US, Yemen became an important ally. On the one hand, Washington realised the importance of gaining a strong foothold in Yemen to attack Al Qaeda in the region and, on the other, the Yemeni government, headed by President Ali Abdullah Saleh understood the importance of US support to maintain its authoritarian assertion against the Houthi rebels in Yemen.²

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1. "CIA Killed Al-Qaeda Suspects," BBC, 5 November 2002, <http://news.bbc.co.uk/2/hi/2402479.stm>
2. The Houthis are Zaidi Shia tribesmen from Northern Yemen. During this period, the Houthis had become one of the strongest rebel groups in Yemen with their own flags, leadership, organisation and, most importantly, public support. They were one of the biggest challengers to the Yemeni government and it was imperative for Saleh to defeat them.

After 9/11 and the subsequent declaration of the War on Terror by the US, Yemen became an important ally. On the one hand, Washington realised the importance of gaining a strong foothold in Yemen to attack Al Qaeda in the region and, on the other, the Yemeni government, headed by President Ali Abdullah Saleh understood the importance of US support to maintain its authoritarian assertion against the Houthi rebels in Yemen.

A couple of month's post 9/11, on November 25-27, 2001, Saleh visited Washington and publicly stated his support for the War on Terror. He met President Bush and pledged his assistance for the US policies in West Asia. In return, he sought economic and military support as well as assurances of reduced pressure on matters such as democratisation. He signed a US\$ 400 million deal with Washington which not only included an economic package but also military aid.³ As per the deal, the US was allowed to legally step into the soil of Yemen to 'create a counter-terrorism camp' which was to be run by the Central Intelligence Agency (CIA) and the US Marines in order to train Yemeni soldiers

to combat Al Qaeda terrorists. The then CIA Director George Tenet was the man behind this deal and he assured Saleh that it was beneficial for Yemen and its government to have strong Special Forces trained by the US military who could provide quick support from their local base in Yemen. Yemen also received high-mobility multi-purpose wheeled vehicles and armoured personnel carriers. The *coup de grace* of the deal was the approval by Saleh to fly Predator drones armed with Hellfire missiles over Yemen.⁴ According to Jeremy Scahill, the Predator drones were parked in Camp Lemonier in Djibouti which is just 245km flying distance away from Aden in Yemen.⁵

Until November 2001, the US military aid to Yemen was negligible. There was no military financing, while military sales had dwindled down to just 8

3. Barak A. Salmoni, Bryce Loidolt, Madeleine Wells, "Regime and Periphery in Northern Yemen: The Huthi Phenomenon," RAND Corporation, April 28, 2010, pp. 124-128.

4. Ibid.

5. Jeremy Scahill, "The Dangerous US Game in Yemen," *The Nation*, April 18, 2011, <https://www.thenation.com/article/dangerous-us-game-yemen/>

percent of the total that was sold in the early 1990s. The International Military and Training Programme had also reduced to one-third of its intake. The United States Agency for International Development (USAID) had already closed its doors by the mid-1990s and there was almost no civil aid coming from Washington to Yemen. Suddenly, things changed dramatically after the November 2001 meeting.⁶

A few months later, in March 2002, US Vice President Dick Cheney visited Sana'a and discussed increasing military aid in terms of deputation of US military advisers to train counter-terror and Special Forces units in the Yemeni Army. Saleh, on the other hand, agreed to share intelligence against Al Qaeda in Yemen.⁷ These high profile meetings played a very important role as they slowly set the stage for US interference in the domestic arena of Yemen. It not only established the infrastructure for future military excursions in the region but also provided legitimacy to the US to pursue the same. Further, it helped the US to officially declare Yemen as part of the combat zone in support of Operation Enduring Freedom.⁸ This allowed the US to deploy its Special Forces in Yemen. The Yemeni government, facing stiff opposition from its population, stated that the US soldiers were deployed to aid the home forces against Al Qaeda and denied that it would allow the US troops to take part in any operations on its territory.⁹ However, the reality of the statement was soon showcased.

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6.. Barak A. Salmoni, Bryce Loidolt, Madeleine Wells, "Regime and Periphery in Northern Yemen: The Huthi Phenomenon," RAND Corporation, April 28, 2010, pp. 124-128

7. Michael Gordon, "A Nation Challenged: The Vice President Cheney Asks Yemen to Join the Pursuit of Al Qaeda's Remnants," *New York Times*, March 15, 2002, <https://www.nytimes.com/2002/03/15/world/nation-challenged-vice-president-cheney-asks-yemen-join-pursuit-al-qaeda-s.html>

8. Laurence Kapp, "Operations Noble Eagle, Enduring Freedom, and Iraqi Freedom: Questions and Answers About U.S. Military Personnel, Compensation, and Force Structure," Congressional Research Service, February 16, 2005, <https://fas.org/sgp/crs/natsec/RL31334.pdf>

9. Michael Smith, "US Special Forces in Djibouti as 'Stepping Stone' to Yemen," *The Telegraph*, September 19, 2002, <https://www.telegraph.co.uk/news/worldnews/africaandindianocean/djibouti/1407680/US-special-forces-in-Djibouti-as-stepping-stone-to-Yemen.html>

THE FIRST DRONE ATTACK IN YEMEN

On November 3, 2002, the CIA conducted its first lethal drone strike outside a war zone in Yemen by killing six men, including al-Harethi.¹⁰ These half-dozen men, including an American citizen, were travelling in a car through the desert in the Marib province (which is east of Sana'a) when they were killed by a Hellfire missile shot from a US Predator drone.¹¹ This attack was one of the first successful strikes by American drones which set a precedent of targeted killing through drones in Yemen.

The 2002 drone attack became the subject of debate regarding the legality of killing through drones which were earlier used only for surveillance purposes. The Yemeni Cabinet suggested that the six men died due to an accidental explosion of explosives that were being carried in the car.¹² In Washington, on the other hand, officials quickly admitted that the CIA had carried out the operation.¹³ This forced the Yemeni Cabinet to issue a brief statement urging "people to be united against terrorist activities that targeted our country, its people and its national economy..."¹⁴ In the statement, there was no clarity if the Yemeni authorities were aware of this sudden attack or if any permission was sought by Washington to conduct the strike.

Many countries like Sweden, Germany and France put across their disapproval of the strike. Swedish Foreign Minister Anna Lindh said, "If

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10. The dead included Al Qaeda leader Qa'id Salim Sinan al Harithi, also known as Abu Mi (one of the alleged masterminds behind the USS *Cole* attack) and Abu Ahmad al Hijazi, a naturalised US citizen also known as Kemal or Kamal Darwish. The other four killed were identified as Salih Hussain Ali al Nunu or Zono (aka Abu Humam); Awsan Ahmad al Tarihi (aka Abu al Jarrah); Munir Ahmad Abdallah al Sauda (Abu Ubaidah); and Adil Nasir al Sauda (Abu Usamah, initially identified as al-Qia'gaa). All six names were released by the Yemen government three weeks after the attack. For more details, please see, "Yemen: Report US Covert Actions since 2001-2011," The Bureau of Investigative Journalism, <https://www.thebureauinvestigates.com/drone-war/data/yemen-reported-us-covert-actions-2001-2011>
 11. James Risen, "Threats and Responses: Drone Attack," *New York Times*, November 8, 2002, <https://www.nytimes.com/2002/11/08/world/threats-responses-drone-attack-american-was-among-6-killed-us-yemenis-say.html>
 12. David Johnston, "Threats and Responses: Hunt for Suspects; Fatal Strike in Yemen," *The New York Times*, November 6, 2002, <https://www.nytimes.com/2002/11/06/world/threats-responses-hunt-for-suspects-fatal-strike-yemen-was-based-rules-set-bush.html>
 13. "CIA killed al-Qaeda Suspects in Yemen," BBC, November 5, 2002, <http://news.bbc.co.uk/2/hi/2402479.stm>
 14. Brian Whittaker, "Killing Probes the Frontiers of Robotics and Legality," *The Guardian*, November 6, 2002.

the USA is behind this, with Yemen's consent, it is nevertheless a summary execution that violates human rights. If the USA has conducted the attack without Yemen's permission, it is even worse. Then it is a question of unauthorized use of force."¹⁵ Increasing international pressure against the drone attack pushed the US on its back foot and it released a statement stating, "American citizens working for Al Qaeda overseas can legally be targeted and killed by the CIA under President Bush's rules for the war on terrorism. The authority to kill US citizens is granted under a secret finding signed by the president after the 11 September attacks that directs the CIA to covertly attack Al Qaeda anywhere in the world. The authority makes no exception for Americans, so permission to strike them is understood rather than specifically described."¹⁶ In other words, with this statement, the US openly declared two major developments

- The US could strike any country, at any time without requiring the permission of the stated country if it perceived that the country was involved in the war on terrorism and an American citizen was involved in the same. This widened the theatre of the War on Terror.
- America was not accountable to any country or authority for any strikes they carried out for the cause of the War against Terror.

However, this statement was challenged vehemently by the Americans themselves. The CIA authorities claimed that the American citizen, Kamal Derwish, who was in the car along with Qaid Salim Sinan al-Harethi, was the leader of an Al Qaeda cell in suburban Buffalo, New York. This was challenged by the then president of the American Muslim Council's Buffalo chapter Mohamed Albanna who said, "Derwish has not been tried and has not been found guilty so, in that sense, he's still an innocent American who was killed. That's what the law states."¹⁷

The matter was raised in the UN and after much deliberation, on January 2003, the UN's Special Rapporteur on Extra-Judicial, Summary or Arbitrary

15. Ibid.

16 Sue Chan, "Licence to Kill," CBS News, December 3, 2002, <https://www.cbsnews.com/news/cias-license-to-kill/>

17. Ibid.

With the increasing negative public opinion, Condoleezza Rice, the then president's national security adviser stepped in and stated that there was no constitutional violation in conducting the drone strike. She argued that this was within the ambit of the constitutional rights of the president when America was at war.

Executions Asma Jahangir issued her first report on the US drone strike that took place outside of the battlefield. The report noted, "The Special Rapporteur acknowledges that governments have a responsibility to protect their citizens against the excesses of non-state actors or other authorities, but these actions must be taken in accordance with international human rights and humanitarian law. In the opinion of the Special Rapporteur, the attack in Yemen constitutes a clear case of extrajudicial killing."¹⁸ The US, in retaliation, responded by stating, "The Government of the United States respectfully submits that inquiries relating to allegations stemming

from any military operations conducted during the course of an armed conflict with al Qaeda do not fall within the mandate of the Special Rapporteur."¹⁹ With this, the matter came to a closure in the UN, despite several countries contesting the statement.

With the increasing negative public opinion, Condoleezza Rice, the then president's national security adviser stepped in and stated that there was no constitutional violation in conducting the drone strike. She argued that this was within the ambit of the constitutional rights of the president when America was at war.²⁰ However, she didn't clarify that in this case, America was not at war against a country but against a non-state actor whose presence was spread across countries. Thus, the constitutional rule of presidential power during conflict/war as it exists could not be applied in this case and the legality of the issue is still not resolved. Andrew Cohen, the legal

18. "Extrajudicial, Summary or Arbitrary Executions: Report of the Special Rapporteur, Asma Jahangir," December 22, 2003, <http://repository.un.org/handle/11176/247080>

19. Philip Alston, Jason Morgan-Foster, William Abresch, "The Competence of the UN Human Rights Council and its Special Procedures in Relation to Armed Conflicts: Extrajudicial Executions in the 'War on Terror'", *European Journal of International Law*, vol 19, issue 1, February 1, 2008, pp. 183–209.

20. Ibid.

analyst, in CBS News, sums up this debate by stating, "This is legal because the president and his lawyers say so—it's not much more complicated than that."²¹

DRONE ATTACKS UNDER OBAMA PRESIDENCY

Under the Bush Presidency, there was just one drone attack which has been discussed above. In 2009, with the onset of the Obama presidency, the drone game in Yemen changed completely. The same year was an important milestone in the history of Yemen. Al Qaeda in the Arabian Peninsula (AQAP) was formed in January 2009 when two distinct branches of Al

Qaeda came together to form a single militant organisation. In its inaugural video, aired in early 2009, the then leader of AQAP Nasir al-Wuhayshi formally declared the union of the Saudi and Yemeni strands of Al Qaeda.²² However, the antecedents of this insurgent group can be traced back to the 1990s when hundreds of Mujahideen returned from Afghanistan after years of fighting with the Soviets. Due to the collapse of the Soviet Union and the changing geopolitical landscape, these former Mujahideen were not allowed to resettle in their own countries like Saudi Arabia and Iraq. They were instead welcomed by the then Yemeni ruler, Ali Abdullah Saleh, with open arms.²³ He dispatched these militants on a *jihad* to fight against the Soviet-backed Marxist government of South Yemen. The southern secessionists were crushed by these experienced *jihadists* and, subsequently, Northern and Southern Yemen were unified under Saleh's rule in 1990.²⁴

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21. Chan, n.16.

22. "Al-Qaeda in the Arabian Peninsula", Council on Foreign Relations Backgrounder, 19 June 2015, <http://www.cfr.org/yemen/al-qaeda-arabian-peninsula-aqap/p9369>.

23. Ibid.

24. John Rolins, "Al Qaeda and Affiliates: Historical Perspective, Global Presence, and Implications for U. S. Policy," Congressional Research Service, February 5, 2010.

These militants settled in South Yemen and started to form rudimentary terror outfits. However, after the November 2001 meeting between Saleh and President Bush, these outfits became the primary target of the Yemeni Army. From 2002 to 2006, President Saleh led an active operation against them and they were forced to either flee from Yemen or remain in hiding.²⁵

On February 3, 2006, there was a massive prison break-out in Yemen, in which 23 alleged Al Qaeda militants in Yemen escaped, including Jamal al-Badawi, Qasim al-Raymi and Nasir al-Wuhayshi (who became the leader of AQAP when it was officially formed in January 2009).²⁶ These three militants fled to Southern Yemen and started taking in new recruits and experienced Arab fighters who were returning from Iraq and Afghanistan. The group established several bases to launch fresh attacks and were protected by the local tribes who had got increasingly disenchanted with the Saleh government. The group rallied on the grounds of "resurrecting Al Qaeda from the ashes to save Yemen from the despotic rule of Saleh and destroy America which had completely crippled the country through drone attacks."²⁷ This incident of the prison break-out was instrumental in completely turning the history of Al Qaeda. Several analysts like Gregory D. Johnsen have argued that President Saleh was an accomplice to the same.²⁸ In November 2005, when President Saleh visited the US in the hope of being rewarded for Yemen's help in the War against Terror, he was informed that the Yemeni government was suspended from the USAID programme. President Bush, during his meeting with President Saleh, called on the latter's bluff regarding Yemen's participation in the War on Terror, especially when it was providing safe haven for Al Qaeda operatives. He quoted the then US Ambassador to Yemen Thomas Krajeski who had claimed that "all democratic processes in Yemen had stopped." On the other hand, President Saleh reiterated his firm stand against terrorism and corruption but to no avail. Johnsen points out that "permitting a prison break in a high profile prison cell allowed Saleh to

25. Gregory D. Johnsen, *The Last Refuge: Yemen, Al-Qaeda, and America's War in Arabia* (New York: W.W. Norton, 2013), p. 59.

26. *Ibid.*, p. 63.

27. *Ibid.*, p. 63.

28. *Ibid.*, p. 68.

dictate his terms again to the US"²⁹ Daniel Byman concurs and argues that "Saleh realised that it needed terrorists on the move to continue getting aid from the U.S."³⁰

Nevertheless, the escape of key militants from the prison set the course for the formation of AQAP. Soon after their escape, they were able to attempt simultaneous attacks on oil and gas facilities in Marib and Hadhramaut. In March 2007, Al Qaeda officially announced its reemergence, naming Al Wuhayshi as its commander.³¹ It underlined its renewed presence in the country with a suicide attack on a convoy of Spanish tourists a few days later. They started carrying out several scattered suicide attacks across Saudi Arabia and Yemen. The series of suicide attacks culminated in September 2008 when the US Embassy was attacked in Riyadh, resulting in 18 deaths.³² The US started pressurising the Saudi monarchy to renew its fight against Al Qaeda. Subsequent raids and the intense crackdown forced several Al Qaeda militants to flee to their brethren in Southern Yemen. The time was ripe for the formation of a unified militant organisation in the form of AQAP.

The first official operation of AQAP took place in August 2009 when they tried to attack Saudi Arabia's security chief Prince Mohammed Nayef. The suicide bomber had concealed a high explosive device inside his body and tried to blow away the convoy of the prince.³³ Even though he was successful, the prince survived. A few months later, in November 2009, Nidal Hasan, a military psychiatrist, suddenly opened fire at Fort Hood Army base when he was preparing to deploy with his unit. Around 13 people were killed and 30 were wounded. He was declared a hero by the AQAP who

29. *Ibid.*, pp. 70-72.

30. Daniel Byman, "Our Two-Faced Friends in Sana'a", *The Slate*, January 5, 2010.

31. Fred Burton, "Al Qaeda in the Arabian Peninsula: Desperation or New Life?" *Stratfor Global Intelligence*, January 28, 2009, http://www.stratfor.com/weekly/20090128_al_qaeda_arabian_peninsula_desperation_or_new_life

32. Ellen Knickmayer, "Attack Against U.S. Embassy In Yemen Blamed on Al-Qaeda," *The Washington Post*, September 18, 2008, <http://www.washingtonpost.com/wp-dyn/content/article/2008/09/17/AR2008091700317.html?noredirect=on>

33. Margaret Coker, "Assassination Attempt Targets Saudi Prince," *The Wall Street Journal*, August 29, 2009, <http://online.wsj.com/article/SB125144774691366169.html>

Mansour Hadi became the president of Yemen on February 21, 2012, in an uncontested election. The transition of power was followed by a series of uprisings and protests that created a situation which swiftly deteriorated into a civil war.

accepted that he had been radicalised by the group.³⁴ On Christmas day of the same year, a Nigerian man, Umar Farouk Abdulmutallab, tried to detonate a bomb concealed in his underwear in an attempt to destroy a Northwest Airlines Airbus A330. He confessed to the CIA investigators that AQAP operatives had trained him in Yemen.³⁵ In the light of these events, in January 2010, the Yemeni government launched a major offensive against AQAP, with the support of numerous US troops. The US not only provided intelligence but also deployed unmanned drones and fired cruise missiles.³⁶

They targeted the organisation's senior leaders and training camps in the governorates of Shabwa, Abyan and Marib. During 2009 and 2010, there were only three drone strikes while the majority of the offensive was carried out by the Yemeni military, assisted by US troops stationed in Yemen.

DRONE ATTACKS DURING ARAB SPRING (2011-14)

The tides again changed for AQAP when the Arab Spring reached the shores of Yemen in 2011. From then, till early 2015, AQAP became embroiled in the domestic politics of Yemen. Due to the popular unrest, President Ali Abdullah Saleh who came to power in 1978, ceded his position to Abd Rabbuh Mansour Al Hadi under the proposals of a Gulf Cooperation Council (GCC) initiative on November 23, 2011.³⁷ Mansour Hadi became the president of Yemen on February 21, 2012, in an uncontested election.

34. Billy Kember, "Nidal Hasan Sentenced to Death for Fort Hood Shooting Rampage," *The Washington Post*, August 28, 2013, https://www.washingtonpost.com/world/national-security/nidal-hasan-sentenced-to-death-for-fort-hood-shooting-rampage/2013/08/28/aad28de2-0ffa-11e3-bdf6-e4fc677d94a1_story.html?utm_term=.c656513e54f6

35. "Underwear Bomber Abdulmutallab Sentenced to Life," *BBC*, February 16, 2012, <http://www.bbc.com/news/world-us-canada-17065130>

36. Johnsen, n. 25, p. 112

37. Laura Kasinof, "Yemen: From the Arab Spring to a Leaderless Nation", *Defence One*, January 15, 2015, <http://www.defenseone.com/threats/2015/01/yemen-arab-spring-leaderless-nation/103692/>

The transition of power was followed by a series of uprisings and protests that created a situation which swiftly deteriorated into a civil war. Protestors loyal to the Saleh family sporadically attacked several government institutions that led to violent responses by the pro-government forces. The Shia group known as the Houthis, who live in the northwestern part of the country, began running a parallel government in three provinces of Yemen, namely al-Jawf, Hajjah and Sa'ada. They consolidated their power, using the power vacuum created by the uprisings in 2011.³⁸ Due to the lack of political stability as well as the complete failure of the military structure in Yemen, AQAP began to expand its territorial hold and began running a parallel government in the Southern province in alliance with various local tribes. Osama bin Laden, who was safely ensconced in Pakistan during this time, sent out a statement urging AQAP to focus on "filling the gap in governance and winning over the civilian population as Yemen was the most suitable for *jihad*."³⁹

Soon after, in September 2012, Mansour Hadi announced an army offensive against AQAP in the Southern province, backed by US forces. This was supported by a three-fold increase in the number of drone attacks authorised by President Obama.

The rise of AQAP was a red flag to the White House which compelled the US military to increase its momentum in its Yemen campaign. This led to a sharp spike in the number of drone attacks in 2011 from the previous years.⁴⁰ One of the most high-profile drone strikes during the year was carried out on September 30, 2011, when Anwar-al Awlaki was killed. Al-Awlaki was a well-known Yemeni-American preacher but the US officials alleged that he was a recruiter for AQAP. The attack was the first known case of the American government targeting and killing a civilian through a drone

38. Salmoni, et al., n. 3, pp. 143-44.

39. Ibid.

40. "Yemen: Reported US Covert Actions since 2001-2011," The Bureau of Investigative Journalism, <https://www.thebureauinvestigates.com/drone-war/data/yemen-reported-us-covert-actions-2001-2011>

strike.⁴¹ Two weeks later, Al-Awlaki's 16-year-old son was also killed in a drone strike which was labelled as a collateral death by the US. However, many analysts claim otherwise.⁴²

Soon after, in September 2012, Mansour Hadi announced an army offensive against AQAP in the Southern province, backed by US forces. This was supported by a three-fold increase in the number of drone attacks authorised by President Obama. There were 47 drone strikes that were authorised and which resulted in the deaths of 279 people.⁴³ This, however, did not stop AQAP from launching major terror attacks. In May 2012, as a way of protesting against the new government which they felt was a puppet government under the leadership of Western powers, they bombed a military parade in Sana'a that killed more than 120 people.⁴⁴

By the beginning of 2013, Yemen became embroiled in democratic processes like the National Dialogue Conference (NDC) in which most of the stakeholders, including President Hadi, became involved.⁴⁵ A series of dialogues took place between the stakeholders in order to rewrite the Constitution of Yemen. This made the armed offensive against the AQAP take a back seat to the Yemeni forces. Without a partner, the US military too scaled down its operations during the year by limiting its drone strikes to 24.

The NDC slowly started unravelling by the end of 2013. The Southern leaders boycotted the NDC as they rejected the notion of a coalition government and instead called for a split in the country.⁴⁶ Completely disillusioned by the ruling government and its lack of steps to improve the conditions, several thousands of people came out and protested against it. On October 14, thousands of people demonstrated in Aden in support of

41. "Awlaki Family Files Suit against US Government over Drone Strikes," *The Fox News*, July 18, 2012, <https://www.foxnews.com/politics/awlaki-family-files-suit-against-us-government-over-drone-strikes>

42. *Ibid.*

43. "US to Step up Drone Strikes Inside Yemen," *The New York Times*, April 26, 2012, <https://www.nytimes.com/2012/04/26/world/middleeast/us-to-step-up-drone-strikes-inside-yemen.html?mtrref=www.google.co.in&gwh=2435D611B007850E7ADA534C858D6F13&gwt=pay>

44. "'Al-Qaeda Attack' on Yemen Army Parade Causes Carnage," *BBC*, May 21, 2012, <https://www.bbc.com/news/world-middle-east-18142695>

45. Charles Schmitz, "Yemen's National Dialogue," *Middle East Institute*, March 10, 2014, <http://www.mei.edu/content/yemens-national-dialogue>

46. *Ibid.*

secession and self-determination. They issued a statement calling on the Yemeni government and all military personnel stationed in the south to withdraw by March 30, 2015.⁴⁷ Over the following weeks, pro-independence rallies continued. In December 2014, several government buildings in Aden were taken over by the members of the Southern Movement.

In the garb of independence rallies, AQAP escalated its terrorist attacks in the country, targeting Houthis and government institutions. On February 13, 2014, AQAP militants carried out an attack on the central prison in Sana'a, freeing 29 prisoners, including 19 suspected of affiliation with AQAP.⁴⁸ Between April to December 2014, they carried out 28 distinct terror blasts in which more than 86 soldiers and around 150 Houthi tribesmen were killed.⁴⁹ However, the US reduced the number of drone strikes further to just 17 air strikes.⁵⁰ This change in tactic can be attributed to two factors. Firstly, President Obama did not want to interfere in the domestic goings on in Yemen.⁵¹ An active military presence or carrying out military strikes without the Yemeni military's involvement would have been construed as direct interference by the US in the internal affairs of the country. President Obama chose to de-escalate the drone attacks and pursue a 'wait and watch' policy instead. Secondly, in his second term, President Obama became hesitant to use force or commit troops, especially in the wake of the anti-ISIS (Islamic State of Iraq and Syria) campaign.⁵² He further consolidated regulations on drone strikes by putting in place several restrictions on drone strikes, especially those that had the potential of high civilian casualties. Additionally, he insisted on routing all drone strike commands through the White House instead of

47. "Yemen", *UNSC Report*, December 2014, http://www.securitycouncilreport.org/monthly-forecast/2014-12/yemen_12.php.

48. Bill Rogio, "AQAP Storms Prison in Yemen's Capital, Frees Al Qaeda Operatives," *The Long War Journal*, February 13, 2014, https://www.longwarjournal.org/archives/2014/02/aqap_storms_prison_i.php

49. Ginny Hill, *Yemen Endures: Civil War, Saudi Adventurism and the Future of Arabia* (Oxford University Press, August 2017).

50. "Drone Strikes in Yemen," The Bureau of Investigative Journalism, <https://www.thebureauinvestigates.com/projects/drone-war/yemen>

51. William A. Rugh, "Problems in Yemen, Domestic and Foreign," Middle East Policy Council, vol. 22, no.4, <http://www.mepc.org/journal/problems-yemen-domestic-and-foreign>

52. "Obama Won't Send Ground Troops to Fight ISIS," *The News Week*, November 16, 2015, <https://www.newsweek.com/obama-wont-send-ground-troops-fight-isis-395249>

War against the Houthis provided a suitable environment for the expansion of Al Qaeda. The withdrawal of government army units from their bases in the South allowed Al Qaeda to acquire very large quantities of sophisticated and advanced weapons, including shoulder-fired missiles and armed vehicles.

the Pentagon.⁵³ This further stifled the US military plan of action in Yemen. His three Secretaries of Defence—Robert Gates, Leon Panetta and Chuck Hagel—accused the Administration of excessively interfering in military matters. In his memoirs, Robert Gates says that “the controlling nature of the Obama White House and the staff took micromanagement and operational meddling to a new level.”⁵⁴

SAUDI-LED INTERVENTION IN YEMEN

In Yemen, the domestic situation worsened drastically. The Houthis consolidated their power in Sana’a by January 2015 which compelled Mansour Hadi to flee to Aden in February.⁵⁵ In this backdrop, AQAP managed to expand its territories in the Southern part of the country and create a mini-state. Even though its leader Nasir al-Wuhayshi was killed in an American drone strike, the organisation continued to flourish under its new leader Raymi. A senior Yemeni government official said the war against the Houthis provided a suitable environment for the expansion of Al Qaeda. The withdrawal of government army units from their bases in the South allowed Al Qaeda to acquire very large quantities of sophisticated and advanced weapons, including shoulder-fired missiles and armed vehicles.”⁵⁶ Most of the Yemeni forces withdrew from the Southern

53. “Pentagon to Take Over Some CIA Drone Operations : Sources,” Reuters, May 21, 2013, <https://www.reuters.com/article/us-usa-drones/pentagon-to-take-over-some-cia-drone-operations-sources-idUSBRE94K03720130521?feedType=RSS>

54. “Pentagon ex-Head Gates Criticises Obama’s Afghan Tactics,” BBC, January 8, 2014, <https://www.bbc.com/news/world-us-canada-25645855>

55. “Yemen Crisis: President Hadi Flees as Houthi Rebels Advance,” BBC, March 25, 2015, <https://www.bbc.com/news/world-middle-east-32048604>

56. Greg Miller, “Al-Qaeda Group Is Taking Advantage of Yemen Chaos to Rebuild, Officials Say,” *Washington Post*, April 5, 2015, http://www.washingtonpost.com/world/national-security/al-qaeda-franchise-in-yemen-exploits-chaos-to-rebuild-officials-say/2015/04/04/207208da-d88f-11e4-ba28-f2a685dc7f89_story.html

provinces including Mukalla – which is one of the main sea-ports in the Gulf of Aden – and moved towards the North. The city was left completely defenceless which allowed AQAP fighters to seize government buildings and free around 150 of their comrades from jail. They were supported by tribal leaders who aided them by looting army bases in a bid to claim independence from the North. The entire area became awash with advanced weaponry which was given by the US to the Yemeni government to fight AQAP in the South. They also looted Mukalla’s central bank branch of an estimated US\$ 100 million.⁵⁷

With this swollen war loot, they established a quasi-state, with Mukalla as its capital. The city of Mukalla was important to the AQAP as it provided them with easy access to sea-trade as well as well as a strong defence. They abolished taxes for local residents and established *Sharia* courts. They also gained control over the ports in Mukalla and Ash Shihr where they began to impose tax and custom tariffs on ships and traders.⁵⁸ They started operating speedboats manned by Rocket Propelled Grenade (RPG)-wielding fighters to impose fees on international ship traffic, including tankers and private traders. They earned an estimated amount of US\$ 2 million every day on these port taxes. They also began to run a black market for fuel smuggling. Most of the oil infrastructure came under the control of tribal leaders who were in alliance with AQAP.⁵⁹

On the other hand, in North Yemen, Saudi Arabia and its allies like the UAE, Egypt, Morocco, Jordan, Sudan, Kuwait, Qatar and Bahrain declared Operation Decisive Storm on March 25, 2015, against the coup by the Houthis

The city of Mukalla was important to the AQAP as it provided them with easy access to sea-trade as well as well as a strong defence. They abolished taxes for local residents and established *Sharia* courts.

57. Yara Bayoumy, Noah Browning, Mohammad Ghobari, “How Saudi Arabia’s War in Yemen has Made Al Qaeda Stronger – and Richer,” *Reuters*, April 8, 2016, <http://www.reuters.com/investigates/special-report/yemen-aqap/>

58. *Ibid.*

59. Bruce Reidel, “Al Qaeda’s Hadramawt Emirate,” Brookings Institute, July 12, 2015, <https://www.brookings.edu/blog/markaz/2015/07/12/al-qaidas-hadramawt-emirate/>

which had forced President Hadi to flee the country.⁶⁰ The next few weeks saw a highly destructive operation with a broad spectrum of aerial and naval attacks. The operation was declared to be over on April 21, 2015. The Saudi Defence Ministry announced the commencement of a new phase— Operation Restoring Hope—and the Saudi National Guard was ordered to join the military operation.⁶¹ The air and naval operations have continued till date.

The Obama government did not wholeheartedly support the operation although it realised that defeating the Houthis was of great importance as they were supported by the Iranians.⁶² It attempted to balance between its own war against AQAP and to please its partner in the region—Saudi Arabia – during the operation. It provided intelligence as well as logistical support to the Saudi-led coalition. Further, it increased arms sales to Saudi Arabia and its allies to aid them during the operation.⁶³ By the end of the Obama Presidency in 2016, the US started following an often confusing policy towards Yemen. On the one hand, President Obama criticised Saudi Arabia for the indiscriminate air strikes which had led to a high civilian casualties, by temporarily banning the sale of bombs to Saudi Arabia, while, on the other, he authorised an increasing number of drone strikes. This can be attributed to the fear of increasing Iranian influence in the war-devastated country. One can argue that President Obama did not want Yemen to become a war theatre between Saudi Arabia and Iran, with both countries directly intervening. Thus, he tried to rein in Saudi Arabia while continuing the aggression against AQAP.

President Obama sanctioned the massive expansion of the drone programme in Yemen which was termed as the “global apparatus for killing” by the media.⁶⁴ The use of drones became synonymous with Obama’s ambition

60. Noah Browning, “Arab Coalition in Yemen sees Victory ‘no Matter What’,” *The Sydney Morning Herald*, September 15, 2015, <https://www.smh.com.au/world/arab-coalition-in-yemen-sees-victory-no-matter-what-20150915-gjmmif.html>

61. *Ibid.*

62. Daniel Byman, “The U.S. Yellow Light in Yemen,” Brookings Institute August 3, 2018, <https://www.brookings.edu/blog/order-from-chaos/2018/08/03/the-u-s-yellow-light-in-yemen/>

63. *Ibid.*

64. “Under Obama, an Emerging Global Apparatus for Killing,” *The Washington Post*, December 27, 2011, https://www.washingtonpost.com/national/national-security/under-obama-an-emerging-global-apparatus-for-drone-killing/2011/12/13/gIQANPdILP_story.html?utm_term=.4980685d9e3e

to escalate the war against Al Qaeda while extricating the US military from costly ground wars in West Asia. Thus, targeted killing through drones became a viable option.

DRONE ATTACKS DURING TRUMP PRESIDENCY

Donald Trump took over as the US president on January 20, 2017, when he inherited an escalating counter-terrorism war in Yemen. He gave the issue his priority attention by visiting the headquarters of the CIA on his first full day in office as president and evaluating its drone programme. According to *The Washington Post*, "Trump seemed unimpressed as the head of the CIA's drone campaign told him about how the agency, aiming to limit civilian casualties, had created unique munitions to that end. Instead, he asked, 'Why did you wait?' when the CIA explained how they verified the targets and waited till they were far away from civilian spaces."⁶⁵ Immediately after the meeting, there was a dramatic increase in the number of drone attacks in Yemen.

Further, to escalate the drone war, Trump has completely taken a U-turn in the US presidential policies regarding drone attacks in Yemen. In 2013, President Obama declared Yemen as no longer a part of the active war zone and, thus, any planned aerial attack approval had to be taken through the White House. The Trump Administration effectively side-stepped the policy by declaring Yemen as an area of "active hostilities" in March 2017.⁶⁶ He also eliminated many safeguards that President Obama had put into place in an effort to minimise civilian casualties. One of the requirements that was completely removed was that officials had to verify that civilians weren't in danger from a planned drone attack before authorisation of the same. Andrew Cockburn, an analyst, points out that any Obama period restrictions on unmanned aerial vehicles during conflict have been "loosened or simply

65. Greg Jaffe, "For Trump and his Generals, 'Victory' has Different Meanings," *The Washington Post*, April 5, 2018, https://www.washingtonpost.com/world/national-security/for-trump-and-his-generals-victory-has-different-meanings/2018/04/05/8d74eab0-381d-11e8-9c0a-85d477d9a226_story.html?utm_term=.1a2b4174f4ad

66. Charlie Savage, Eric Schmitt, "Trump Administration Is Said to Be Working to Loosen Counterterrorism Rule," *The New York Times*, March 12, 2017, <https://www.nytimes.com/2017/03/12/us/politics/trump-loosen-counterterrorism-rules.html>

shredded.”⁶⁷ In other words, President Trump removed all restrictions that were put in place for the drone programme by the Obama Administration and, instead, took an aggressive stand on the usage of drones to fight terror. Gen Thomas Waldhauser, who was in charge of US military operations in West Asia during 2017 said that he now had “leeway to order strikes without clearing them with the White House.”⁶⁸

In 2017, the number of drone strikes increased to double those of 2016. The US military, along with the CIA, has carried out 127 air strikes, including 86 drone strikes against AQAP and ISIS in Yemen.⁶⁹ This is a massive increase from 47 strikes that were carried out in 2016, which was the last year of the Obama Administration. Till September 2018, there were 35 confirmed US drone strikes.

Table 1: Types of Strikes by Various US Administrations

Year	Administration	Drone Strikes	Air Strikes	Total Strikes
2002	Bush	1	0	1
2003	Bush	0	0	0
2004	Bush	0	0	0
2005	Bush	0	0	0
2006	Bush	0	0	0
2007	Bush	0	0	0
2008	Bush	0	0	0
2009	Obama	1	0	1
2010	Obama	2	0	2
2011	Obama	10	3	13
2012	Obama	47	9	56
2013	Obama	24	1	25

67. Andrew Cockburn, *Kill Chain: The Rise of the High-Tech Assassins*, (Henry Holdt & Co., 2015), p.12

68. Ryan Browne, “Pentagon Receives more Freedom to Carry out Counterterror Raids,” CNN, March 14, 2017, <https://edition.cnn.com/2017/03/14/politics/pentagon-authority-yemen-libya-somalia-counterterrorism/index.html>

69. “CENTCOM Updates Counterterrorism Strikes in Yemen,” US Central Command, 2018, <http://www.centcom.mil/MEDIA/PRESS-RELEASES/Press-Release-View/Article/1523709/centcom-updates-counterterrorism-strikes-in-yemen/>

2014	Obama	17	0	17
2015	Obama	24	0	24
2016	Obama	42	1	43
2017	Trump	86	41	127
2018	Trump	26	9	35

Source: The Bureau of Investigative Journalism

The surge of drone strikes in Yemen can be attributed to three main factors. First, it helps President Trump to keep one of his most important campaign promises, “to bomb the s--- out of ISIS.”⁷⁰ Since the Battle of Raqqa in 2017, there has been an increase in terror activities by a newly formed group in Yemen known as the ISIS-Y. It is one of the offshoot groups that has mainly members who have returned from Syria and Iraq after their territory was occupied by the Syrian/US forces. It operates small attack cells and is more deadly than AQAP as it mainly focusses on suicide bombing.⁷¹ It is slowly occupying the vacuum left by the displacement of AQAP in Southern Yemen. Thus, as part of the ‘War of Annihilation’, Southern Yemen became part of the larger war against the ISIS.⁷²

Second, President Trump not only loosened the rules of drone strikes, he also widened the war by authorising the US generals to target certain civilians who were related to terrorists. In an interview with Fox News, President Trump said, “The other thing with the terrorists is you have to take out their families. They care about their lives, don’t kid yourself. When they say they don’t care about their lives, you have to take out their families.”⁷³ In other words, the CIA ‘target list’, as authorised earlier by President Obama would no longer be limited to key terrorist leaders but has been expanded to include foot soldiers, preachers, family members of identified terrorists

70. “Donald Trump: ‘I Would Bomb the s--- out of’ ISIS,” *The Business Insider*, November 13, 2015, <https://www.businessinsider.in/DONALD-TRUMP-I-would-bomb-the-s-out-of-ISIS/articleshow/49773298.cms>

71. “ISIS in Yemen,” *Critical Threats*, <https://www.criticalthreats.org/organizations/isis-in-yemen>

72. Jared Keller, “The US Campaign Against ISIS Is Entering A Deadly New Phase In Yemen,” *Task & Purpose*, December 21, 2017/

73. Margaret Hartmann, “Trump Questioned Why CIA Avoided Killing Terrorist’s Family: Report,” *New York Magazine*, April 6, 2018, <http://nymag.com/intelligencer/2018/04/trump-asked-why-cia-drone-avoided-terrorists-family-report.html>

CIA ‘target list’, as authorised earlier by President Obama would no longer be limited to key terrorist leaders but has been expanded to include foot soldiers, preachers, family members of identified terrorists and any other individual who is seen to be involved with the targeted individuals.

and any other individual who is seen to be involved with the targeted individuals. This definition definitely broadens the scope of attack and the CIA has definitely stepped up its activities in relation to this.

Another aspect of the increasing drone strikes due to the widening of the war theatre is the complete authorisation by President Trump to the CIA and the US military to carry out drone strikes without White House approval.⁷⁴ During the Obama presidency, especially in his second term, there was a deliberate attempt to centralise the command structure of military decisions by routing all resolutions through the

White House. President Trump, on the other hand, has completely outsourced his authority as commander-in chief for military affairs to the Pentagon and the US military.⁷⁵ The group of generals surrounding President Trump – which includes the then Secretary of Defence Gen James Mattis (Marine Corps), National Security Adviser H.R. McMaster (US Army), Chief of Staff Gen John Kelly (Marine Corps) and the Chairperson of the Joint Chief of Staff General Joseph Dunford (Marine Corps) – have been given the authority to raise troop levels in Iraq, Yemen and Syria which is an authority that is usually held by the White House.⁷⁶ This ‘outsourcing of drone warfare’ became evident when the US Air Force dropped a powerful bomb on an alleged ISIS complex in Afghanistan without the approval of President Trump who later said, “What I do is I authorize my military. We have given them total authorization and they have done the job as usual.”⁷⁷ CIA Director Mike Pompeo further added,

74. “Donald Trump Gives CIA Power to Carry out its own Drone Strikes,” *The Independent*, March 14, 2017, <https://www.independent.co.uk/news/world/americas/donald-trump-cia-power-drone-strikes-military-a7628561.html>

75. Steve Niva, “Trump’s Drone Surge: Outsourcing the War Machine,” Middle East Research and Information, Project, <https://www.merip.org/mer/mer283/trumps-drone-surge>

76. *Ibid.*

77. “Trump: I’m Giving the Military ‘Total Authorization,’” *The Military Times*, April 13, 2017, <https://www.militarytimes.com/news/pentagon-congress/2017/04/13/trump-i-m-giving-the-military-total-authorization/>

“When we have asked for more authorities, we have been given it. When we ask for more resources, we get it.” This ‘outsourcing of authorisation’ has allowed the president to distance himself from the actions of the US military.⁷⁸ The latter, on the other hand, has embraced this power by intensifying the air strikes over Yemen and Syria.

Lastly, the changing dynamics of the US-Saudi relations prompted President Trump to increase the number of drone attacks in Yemen. The emergence of Saudi Arabia as a regional hegemon under Crown Prince Mohammad bin Salman has pushed the US to reconsider its relations with the kingdom. Apart from this, there are increased American arms sales to the kingdom due to the Yemen conflict.⁷⁹ Thus, there is very little possibility that President Trump will try to antagonise the strongest US ally in the region by not aiding it during the conflict.

IS THE DRONE WARFARE EFFECTIVE IN YEMEN?

After 16 years of drone attacks in Yemen, the question still lingers on the effectiveness of the same. More than 345 drone attacks have killed hundreds of innocent civilians and children. These attacks have been criticised by several countries and human rights organisations, especially on the question of legality. This had taken the form of debates regarding the legal regime that can be used to judge targeted drone attacks. The human rights communities as well as academics have termed them “extra-judicial executions” while their opponent, i.e. the US, has reasoned their legality in terms of self-defence which allows targeted killing as a legitimate act of war.⁸⁰

The more imperative question that needs to be asked, other than the legality angle, is about the effectiveness of the drone programme. The US has deemed this warfare tactic as “successful” and, thus, it has steadily increased

78. Schmitt and Rosenberg, “C.I.A. Wants Authority to Conduct Drone Strikes in Afghanistan for the First Time,” *The New York Times*, September 15, 2017, <https://www.nytimes.com/2017/09/15/us/politics/cia-drone-strike-authority-afghanistan.html>

79. Byman, n.62.

80. David Kretzmer, “Targeted Killing of Suspected Terrorists: Extra-Judicial Executions or Legitimate Means of Defence?” *European Journal of International Law*, vol. 16, issue 2, April 1, 2005, pp. 171–212 <https://academic.oup.com/ejil/article/16/2/171/566821>

its usage in Yemen.⁸¹ The success of the same can be evaluated using certain parameters which are: killing of AQAP members; deterring the growth of AQAP and other terror activities; and helping create a stable government in Yemen.

Table 2: Impact of Air/Drone Strikes from 2002-18

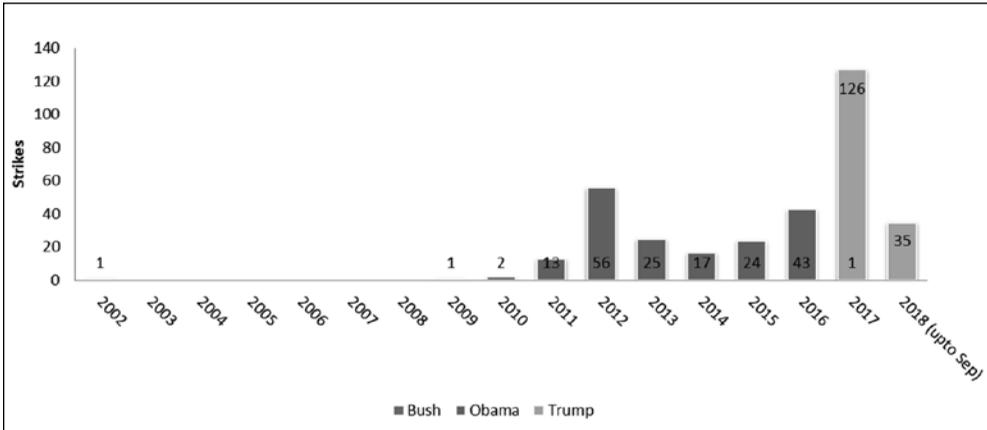
Year	No. of Air and Drone Strikes	No. of People Reported Killed
2002	1	6
2003	0	0
2004	0	0
2005	0	0
2006	0	0
2007	0	0
2008	0	0
2009	1	34
2010	2	7
2011	13	132
2012	56	279
2013	25	129
2014	17	127
2015	24	103
2016	43	209
2017	127	184
2018	35	25

Source: Adapted from The Bureau of Investigative Journalism⁸²

81. Dan de Luce, "The Drones are Back," *Foreign Policy*, March 26, 2018, <https://foreignpolicy.com/2018/03/26/the-drones-are-back/>

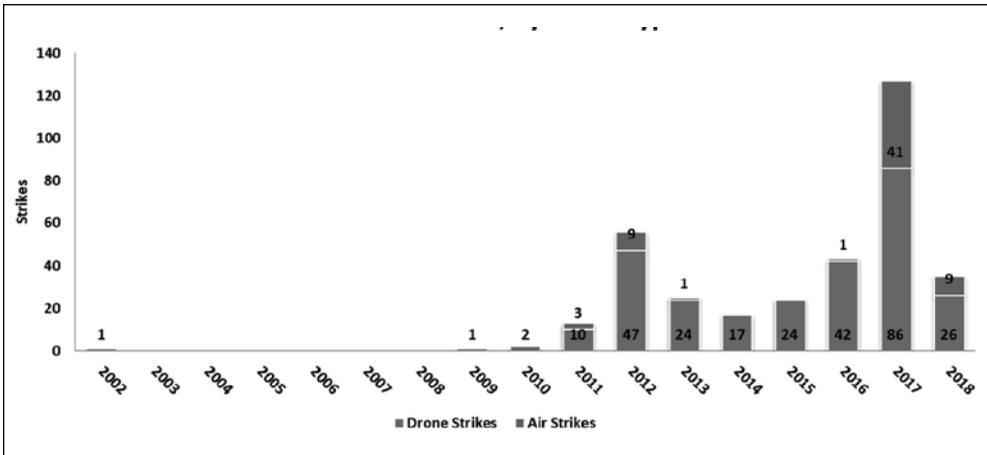
82.. https://docs.google.com/spreadsheets/d/1lb1hEYJ_omI8lSe33izwS2a2lbiygs0hTp2A1_Kz5KQ/edit#gid=977256262

Fig 1: Total US Strikes in Yemen, by Year and Administration



Source: Adapted from The Bureau of Investigative Journalism⁸³

Fig 2: Total US Strikes in Yemen by Strike Type



Source: Adapted from The Bureau of Investigative Journalism⁸⁴

One cannot deny that the drone programme has been successful in eliminating several AQAP leaders who have directly or indirectly aided terror activities across the world. Nonetheless, these leaders are

83. https://docs.google.com/spreadsheets/d/1lb1hEYJ_omI8lSe33izwS2a2lbiygs0hTp2Al_Kz5KQ/edit#gid=977256262

84. https://docs.google.com/spreadsheets/d/1lb1hEYJ_omI8lSe33izwS2a2lbiygs0hTp2Al_Kz5KQ/edit#gid=977256262

quickly replaced by others in the organisation after their death.⁸⁵ Thus, the programme is successful in the short term but is a big failure in its attempt to break the organisation. Secondly, as no full investigation of the targeted individual is ever carried out, one is dependent on the US narrative regarding the profile of the same. Thus, the numbers of AQAP members and supporters who have officially been reported killed as part of the drone warfare is questionable and, most probably exaggerated. Since the Trump presidency has consented to kill a terrorist regardless of the civilians around him, this has further inflated the numbers. It is extremely difficult to establish the civilian status of individuals who are part of the collateral damage. Hence, most of the identities comprises guesswork instead of proper identification.

The US government claims that the drone programme has diminished the possibilities of the growth of the AQAP.⁸⁶ However, the ground reality is contrary to this narrative. Drone strikes are widely reported in the local media and extremely unpopular among the local Yemenis. A survey in 2017 found that 73.5 percent of Yemenis believed that the US drone programme in Yemen justified attacks by AQAP on Americans and other Westerners.⁸⁷ As the drone war intensified, infrastructural and economic conditions also worsened, apart from increasing civilian deaths which directly affected the locals and their lifestyle. The indiscriminate targeting undermined any sense of loyalty towards the Yemeni government. In this backdrop, AQAP provided an alternative to the civilians to fight against the Americans using terror to claim justice and empowerment. Thus, the drone programme is a 'gift from heaven' for AQAP.

Lastly, the continued use of drones during the transitional period of governance when the new Constitution was being framed to usher in a more accountable government indicated the lack of respect for Yemeni

85. Michael Horton, "Drone Warfare in Yemen: A Catalyst for the Growth and Evolution of AQAP," *Jamestown Foundation*, vol 15, issue 17, September 11, 2017, <https://jamestown.org/program/drone-warfare-in-yemen-a-catalyst-for-the-growth-and-evolution-of-aqap/>

86. *Ibid*

87. *Ibid*.

sovereignty.⁸⁸ The constant violation of the same, irrespective of different governments, breeds a sense of disrespect and frustration among the local Yemenis regarding their own government. The public opinion has become increasingly anti-government which aids AQAP and other terror outfits to thrive.

Hence, analysis of the metrics of drone warfare challenges the US narrative of the programme being successful. Instead, it has provided a platform for AQAP to spread its narrative and provide an alternative to the Yemenis. The limited success of the programme has no long-term benefit as it has turned the local Yemenis against their own government as well as the US. However, the world is slowly waking up to this never-ending conflict in Yemen. In the US, there are already winds of change that are slowly challenging the increased drone attacks in Yemen. Around 50 members of the US House of Representatives backed a bipartisan resolution that invoked the 1973 War Powers Act. They declared that Congress never authorised US drone attacks in Yemen, as it is legally bound to do under the Act. They directed President Trump to withdraw all American military personnel from the country. On the other hand, many state leaders compelled the Saudi-led coalition and the Houthis to come together for negotiations. Oman, which is a trusted ally of both parties, has taken the initiative to be the mediator and host the dialogues. This will shift the focus from military operations to political processes which will help Yemen slowly limp back to normalcy in the coming years. There is a need to support this transformative process by every stakeholder in the region, especially the US, which needs to move beyond its current confusing policy of drone attacks as well as support to the Saudi-coalition to bring stability in the country. President Trump has to curtail the drone programme to give peace and stability a fighting chance in Yemen.

88. Jillian Schwedder, "Is the US Drone Program in Yemen Working?" Brookings Institute, September 28, 2015, <https://www.brookings.edu/blog/markaz/2015/09/28/is-the-u-s-drone-program-in-yemen-working/>

THE 1996 ADVISORY OPINION OF THE INTERNATIONAL COURT OF JUSTICE ON THE LEGALITY OF THE THREAT OR USE OF NUCLEAR WEAPONS

SREOSHI SINHA

INTRODUCTION

War is an old phenomenon that has existed since the inception of human civilisation, and the *laws of war*¹ are probably as old as war itself. Since war was an inevitable phenomenon in the history of mankind, a general necessity of having some kind of regulations to limit the sufferings of both combatants and civilians during an outbreak of an armed conflict had emerged. It was found that in the wars fought around the world during ancient times, there was evidence of interesting customs and agreements with ‘humanitarian’ elements in them. These were rules protecting the victims of armed conflicts as well as regulations that prohibited and implied restrictions on the means and tactics of warfare. Such restrictions on warfare had been a temporary phenomenon until the mid-19th century, when the states ratified the first **Geneva Convention of 1864**,² containing ten Articles which were drafted to safeguard all the soldiers of the conflicting parties

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1. Mary Kaldor, *New and Old Wars* (Stanford University Press, 2007).
2. “The Geneva Convention of 1949,” International Committee of the Red Cross, Geneva, August 12, 1949.

The LoAC contains the basic principles and rules which not only govern the choice of weapons by the parties engaged in a conflict, but also prohibit and restrict the employment of certain weapons to protect civilians and persons who are not, or no longer, taking part in a conflict.

who were wounded on the battlefield so that they could be taken care of without any distinction, on the earnest persuasion of the then newly formed **International Committee of the Red Cross (ICRC)**.³

What later came to be known as the **International Humanitarian Law (IHL)**, or the **Law of Armed Conflict (LoAC)**, or simply the **Law of War**, as contained in the four **Geneva Conventions of August 12, 1949**,⁴ and the three Additional Protocols, comprises a monumental work of over 600 Articles implying:

*International Humanitarian Law is a set of rules which seek, for humanitarian reasons, to protect persons who are not, or are no longer, participating in the hostilities and to limit the effects of armed conflict.*⁵

IHL is considered to be one of the oldest branches of public international law. This branch of law which is often termed as the Law of Armed Conflict (LoAC) is a framework of law that defines the legal limitations of such means and methods of warfare that do not discriminate between combatants, civilians and other non-combatants. It addresses the behaviour of combatants, the conduct of hostilities and the choice of means and methods of warfare that also include weapons. Therefore, it contains the basic principles and rules which not only govern the choice of weapons by the parties engaged in a conflict, but also prohibit and restrict the employment of certain weapons to protect civilians and persons who are not, or no longer, taking part in a conflict. It also protects and spares combatants from the extreme effects of warfare and excessive injuries that ultimately serve no military purpose.

3. Ibid.

4. Dr Wg Cdr (Retd) UC Jha, *International Humanitarian Law: The Laws of War* (New Delhi: Vij Books India Pvt Ltd, 2011).

5. n.2.

Due to the evolution of this particular branch of law in the past few years, it can now meet the contemporary developments and challenges in warfare. Apparently, the implementation of IHL to the use of nuclear weapons is not something new. There is a well-recognised identified doctrine covering this discourse. For instance, the US military manuals⁶ broadly recognise the advantageous purposes of this body of law, both in terms of strengthening a state's application of its combat operations without unnecessary expenditures of force, and in terms of fulfilling what has long been regarded as a fundamental purpose of war, i.e. restoring favourable peace. The US Air Force, in its 2009 manual,⁷ recognises that the use of nuclear weapons is subject to the principles of the Law of War generally. The manual states, in particular,

Nuclear weapons, by their definition, are devices of terror that can cause unbearable violence on civilians on an extreme scale. The international community has struggled with the problem of how the Law of War might be applicable to such weapons ever since their first and only use in 1945.

*Under international law, the use of nuclear weapons is based on the same targeting rules applicable to the use of any other lawful weapon, i.e. the counterbalancing principles of military necessity, proportion, distinction, and unnecessary suffering.*⁸

Nuclear weapons, by their definition, are devices of terror that can cause unbearable violence on civilians on an extreme scale. The international community has struggled with the problem of how the Law of War might be applicable to such weapons ever since their first and only use in 1945, when, during the final stages of World War II, the US dropped two atom bombs over the cities of Hiroshima and Nagasaki in Japan, the first on August 6, 1945 and

6. Jha, n.4.

7. Christopher Hubbard, "A Critique of the Advisory Opinion of the ICJ", *Edith Cowan University Online Journal*, 1997.

8. Charles J. Moxley Jr, and John Burroughs, "Nuclear Weapons and Compliance with International Humanitarian Law and the Nuclear Non-Prilifiration Treaty", *Fordham International Law Journal* (The Berkeley Electronic Press), 34, no. 4, 2011.

the second on August 9, 1945.⁹ The radiation had an impact over a large area that affected public health, agriculture, natural resources and infrastructure for years to come. Yet the international community failed to come up with a global treaty that would explicitly ban the use of nuclear weapons, until recently, with the adoption of the Treaty on the Prohibition of Nuclear Weapons.¹⁰

This paper seeks to describe and assess the status of nuclear weapons under IHL as it stands today. Though there has been ongoing research on the desirability of complete eradication of this category of non-conventional means of warfare, great care has been rendered to the *lex lata*¹¹ rules that apply to nuclear weapons.

This paper mainly focusses on the International Court of Justice's (ICJ's) 1996 Advisory Opinion on The Legality of the Threat or Use of Nuclear Weapons (Nuclear Weapons Advisory Opinion) because in any discussion about the applicability of the rules of IHL to nuclear weapons, it is essential to look at the advisory opinion of the ICJ as it had provided the groundwork for the application of the rules of IHL to nuclear weapons. Apart from that, this was the very opinion in which the ICJ had identified the "unique characteristics" of nuclear weapons, rendering the nuclear weapon as potentially "catastrophic". It had also highlighted the fact that "[t]he destructive power of nuclear weapons cannot be contained in either space or time".

This paper would try to broadly look at first the general principles of International Humanitarian Law in relation to the threat or use of nuclear weapons, followed by a brief background to the 1996 Advisory Opinion of the ICJ. It would then delve in detail into the text of the opinion and the outcome of it.

GENERAL PRINCIPLES OF IHL

Although IHL has not completely forbidden the use of nuclear weapons, it comprises a range of general rules regulating the conduct of hostilities which are customary in nature and apply to all weapons used in armed

9. Jha, n.4.

10. Ibid.

11. *Lex lata* is a Latin expression that means "the law as it exists".

conflict. Most important are (a) *the principle of distinction*; (b) *the prohibition on any random attacks*; (c) *the prohibition on inordinate attacks*; (d) *the prohibition on area bombardment*; (e) *the obligation to take measures before any attack*; (f) *the prohibition on using weapons of a nature to cause superfluous injury or unnecessary suffering*; and (g) *the rules on the protection of the natural environment*.¹² There are also other relevant rules and limitations on aggressive reprisals. These principles are conventional in nature, mostly based on the military manuals of various countries that should be considered while discussing the prohibitions implied by IHL on the use of any Weapon of Mass Destruction (WMD). Some of these principles are elaborated below:

- The right to adopt means and methods for injuring members of the opposing party **should be limited**, which means the combatants of both the parties in hostilities are restricted in their use of weapons even where there is a lack of a specific prohibition relating to such weapons.
- The implementation of weapons or tactics giving rise to unnecessary harassment and suffering to the combatants of either party in a conflict is strictly prohibited, which implies that any action in an armed conflict should be compatible with the justifiable intentions of the conflict.
- Attacks that are incompatible with the legitimate military objectives, or are inconsiderate of people, institutions and resources by the laws of military conflict are strictly prohibited. International Humanitarian Law protects civilians and civilian populations, civilian objects, the natural environment, the wounded, sick, shipwrecked, prisoners of war, medical establishments and personnel.¹³
- Use of random tactics of warfare that do not differentiate between combatants and civilians and other non-combatants is strictly prohibited as the legal protection of civilians and other non-combatants is the most fundamental principle of International Humanitarian Law.
- The use of suffocating fatal or other environmentally unfriendly gases and all analogous materials is prohibited as the prohibition of poison and

12. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1. C.J. Reports 1996, p. 226

13. n.2.

poisonous weapons has been set out in the 1925 Geneva Protocol¹⁴ and is part of customary law.

- The tactics of warfare should not cause permanent, widespread and severe damage to the environment. A number of multilateral agreements regarding the protection of the environment have been concluded recently¹⁵.
- The neutrality of non-participating states should not be affected by the means and methods of warfare and in accordance with this rule, hostilities in the territory of an uninvolved or neutral state should not be carried out by the combatants.

BACKGROUND TO THE ADVISORY OPINION

A general prohibition on the use of force had been implied by Article 2(4) of the 1945 UN Charter that stated:

*All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the purposes of the United Nations.*¹⁶

Nevertheless, force has been frequently used and threatened, including threats involving nuclear weapons. Though with the exception of Hiroshima and Nagasaki in 1945, no state till date has used nuclear weapons against any other state, thousands of nuclear weapons, with thousands of times greater output in their destructive capabilities than the atomic bombs used in 1945, have been tested, manufactured, deployed and placed on various levels of alert. It is often affirmed that the 1945 nuclear attacks almost forced Japan to hasten its decision to surrender as the deterrent threat was the actual value that states armed with nuclear weapons have imposed since the World War II.

A few years after the end of the Cold War in 1993, the Centre for Strategic

14. United Nations Environment Programme: An Inventory and Analysis of International Law. Protecting the Environment during Armed Conflict (Nairobi: United Nations Environment Programme, 2009).

15. Ibid.

16. UN Charter.

and International Studies, Nuclear Strategy Study Group, USA, in its report,¹⁷ had stated,

There is no consensus, nor any immediate prospect of one that total and complete disarmament will under any circumstances be a feasible proposition.

According to this report, it would be really unfortunate if the current impetus towards international cooperation for achieving nuclear disarmament, such as through the conclusion of the treaty prohibiting nuclear weapons (Ban Treaty), passed by without establishing a stronger nuclear end state with a view to eliminate the risks of the use of nuclear weapons from the face of the Earth. Furthermore, even the permanent extension of the nuclear Non-Proliferation Treaty in 1995 did not ensure a complete commitment towards disarmament, which, in a way, enhanced certainty around the fact that nuclear disarmament was not likely to be pursued by the nuclear weapon states in any meaningful way in the foreseeable future.

Apart from that, there were some new voices, who wanted to join the international community in the demand of the complete elimination of the use or threat of use of nuclear weapons. In this context, China had been supporting the total elimination of nuclear weapons and had been seeking a no-first use treaty among the weapon-possessing states.¹⁸ While announcing the setting up of the Canberra Commission of experts to work out a plan for total elimination of nuclear weapons, the Australian Prime Minister, Mr. Paul Keating, mentioned that he believed that a world free of nuclear weapons was now feasible. He also further noted that now the international community wanted the nuclear weapon states to carry out their commitments to the total elimination of their nuclear stockpiles by adopting a systematic process to achieve that result. The argument that a world will be an unsafe place

17. *Toward A Nuclear Peace: The Future of Nuclear Weapons in US Foreign and Defence Policy* (Washington D.C.: CSIS Nuclear Strategy Study Group Centre for Strategic and International Studies, 1993), p.67.

18. Tong Zhao, "China's Role in Reshaping the Global Nuclear Non-Proliferation Regime", *St Antony's International Review*, vol. 6, no. 2; *China's Rise and Adapting Global Structures* (February 2011), pp.67-82.

The UN General Assembly, through its Resolution A/RES/49/75K, adopted on December 15, 1994, requested the ICJ to render its advisory opinion on the legality of the threat or use of nuclear weapons under the international law on an urgent basis.

to live in without nuclear weapons was one of the ways to intensify the narrow self-interest of the nuclear weapons possessing states and their allies.¹⁹

Hence, with the end of the Cold War, Non-Governmental Organisations (NGOs) such as the International Physicians for the Prevention of Nuclear War or the International Association of Lawyers against Nuclear Arms, had initially requested the World Health Organisation (WHO) to seek an advisory opinion on the legality of the use or threat of use of nuclear weapons from the International Court of Justice (ICJ), Hague. Since the question raised by the WHO didn't fall under the scope of its functions as provided by Article 96(2) of the UN Charter, the ICJ refused to furnish any advisory opinion on the same.

Therefore, to arrive at an acceptable conclusion, the UN General Assembly, through its Resolution A/RES/49/75K, adopted on December 15, 1994,²⁰ requested the ICJ to render its advisory opinion on the legality of the threat or use of nuclear weapons under the international law on an urgent basis. This resolution was, hence, submitted to the ICJ on December 15, 1994, after being adopted by 78 states who voted in favour of it, 43 against it, 38 abstaining and 26 not voting. Though the voting was initiated by the Non-Aligned Movement (NAM), the voting pattern did not show the integrated position of NAM, but, instead, reflected the post-Cold War international order and actually exposed the national interests of various countries. Apparently, of the five legitimate nuclear weapons possessing countries, only China refrained from participating in the voting.²¹ After the resolution arrived at the World Court on December 18, 1994, a total number of 42 states, including

19. Rhodes Richard, *The Twilight of the Bombs: Recent Challenges, New Dangers, and the Prospect For a World Without Nuclear Weapons* (New York: Alfred A. Knopf, 2010), pp.293-296.

20. n.17, p.16.

21. Zhao, n.18.

India, had furnished written submissions and taken part in the proceedings, and 20 states took part in the verbal hearings before the ICJ rendered its final opinion on July 8, 1996.²²

ROLE OF THE UN GENERAL ASSEMBLY

Through Resolution A/RES/49/75K, adopted on December 15, 1994, the UN General Assembly requested the ICJ to render its advisory opinion on the legality of the threat or use of nuclear weapons on an urgent basis. Earlier, in the autumn of 1993, being instigated by NAM, WHO had asked the court a similar question on the legality of the use of nuclear weapons under IHL, but the question was turned down by the ICJ. Initially, it was also suggested that this matter was more within the capacity of the Security Council rather than that of the General Assembly but the court has shown that the General Assembly is more competent, based on Article 10 of the UN Charter that said:

The General Assembly may discuss any questions or any matters within the scope of the present Charter or relating to the powers and functions of any organs provided for in the present Charter.

And, except, as provided in Article 12 of the UN Charter, “The General Assembly may make recommendations to the members of the UN or to the Security Council, or to both, on any such questions or matters”; it is Article 11(2) that asserts that “the General Assembly may discuss any questions relating to the maintenance of international peace and security brought before it by any member of the UN, or by the Security Council, or by a state which is not a member of the United Nations”, and Article 13 which allows the General Assembly to initiate studies and make recommendations

22. n.12, p.226.

After the resolution arrived at the World Court on December 18, 1994, a total number of 42 states, including India, had furnished written submissions and taken part in the proceedings, and 20 states took part in the verbal hearings before the ICJ rendered its final opinion on July 8, 1996.

for the purpose of promoting international cooperation in the political field and encouraging the progressive development of international law and its codification of the UN Charter.

Again, as Article 96(1) of the UN Charter allows the General Assembly or the Security Council to request the ICJ to give an advisory opinion on any legal question²³, it was determined by the court that it had jurisdiction to reply to the General Assembly's request. Apparently, a total number of 42 states except China (amongst the declared five nuclear weapon states) had been a part of the written phase of the pleadings, which is said to be the largest number of participants in any proceedings ever before the court. India was the only state amongst the "three threshold" nuclear-weapon states that had participated in the proceedings. Other participants – including those developing states which had earlier not contributed to the proceedings before the ICJ – have also shown great interest to participate in the international legal proceedings in this "post-colonial" era. Besides WHO, 22 states – Australia, Egypt, France, Germany, Indonesia, Mexico, Iran, Italy, Japan, Malaysia, New Zealand, Philippines, Qatar, Russian Federation, San Marino, Samoa, Marshall Islands, Solomon Islands, Costa Rica, United Kingdom, United States and Zimbabwe – participated in the verbal hearings of the court which were held from October 30 to November 15, 1995. During the hearings, each state was assigned one and a half hours to make its statement. On July 8, 1996, nearly eight months after the completion of the verbal phase, the ICJ finally furnished its opinion²⁴.

COMPETENCE OF THE COURT

Composition of the Court

The ICJ is composed of fifteen judges elected to nine-year terms by the UN General Assembly and the UN Security Council. The court's "advisory opinion" can only be requested by specific UN organisations, and is

23. n.16.

24. Laurence Boisson de Chazournes, and Philippe Sands, *International Law, the International Court of Justice and Nuclear Weapons* (Cambridge: Cambridge University Press, 1999).

inherently non-binding under the statute of the court. These fifteen judges who gave their advisory opinion regarding the legality of the threat or use of nuclear weapons were: President Mohammed Bedjaoui from Algeria, Vice-President Stephen M. Schwebel from the United States, Judge Shigeru Oda from Japan, Judge Gilbert Guillaume from France, Judge Mohammed Shahabuddeen from Guyana, Judge Christopher Weeramantry from Sri Lanka, Judge Raymond Ranjeva from Madagascar, Judge Shi Jiuyong from China, Judge Carl-August Fleischhauer from Germany, Judge Abdul G. Koroma from Sierra Leone, Judge Géza Herczegh from Hungary, Judge Vladlen S. Vereshchetin from Russia, Judge Luigi Ferrari Bravo from Italy, Judge Rosalyn Higgins from the United Kingdom, Judge Andrés Aguilar Mawdsley (died before the final decision) from Venezuela and Registrar Eduardo Valencia-Ospina from Colombia²⁵.

Through Article 65(1), the Statute of the ICJ allows the court to give an advisory opinion on any legal question at the request of whatever body may be authorised by, or in accordance with, the Charter of the UN to make such a request. It was determined by the court that it had jurisdiction to reply to the request of the General Assembly, since the power of the General Assembly to give an opinion is regulated both by Article 96(1) of the UN Charter, that said "*The General Assembly or the Security Council may request the International Court of Justice to give an advisory opinion on any legal question*" and **Article 65(1)** of the Statute of the ICJ.

As stated above, these Articles provided that the court may issue an advisory opinion on any legal question only when it is requested to do so by the General Assembly and, before doing this, the court must also ensure that the body is "authorized by, or in accordance with, the Charter of the UN to make such a request"²⁶.

The court also needed to assess whether the request made by the General Assembly related to a legal question falls within the ambit of the Statute of the ICJ and the UN Charter, i.e. the compatibility of the threat or use of nuclear weapons with international law. In this connection,

25. n.12, p.226.

26. n.16.

it can be said that the political nature of the motive that gave rise to the request or the political implications of any advisory opinion, and any political aspects of the legal question are not that significant while establishing its jurisdiction to give its opinion. However, the jurisdiction of the court instead depends on whether the requesting organ (in this case, it is the General Assembly) has followed the correct procedure and is not acting *ultra vires*,²⁷ or outside its jurisdiction. Apart from that, the court should also determine the legality of the question raised. Finally, after establishing its competence, the court shall further consider whether or not it should exercise its inherent discretionary power while giving the opinion. The court shall also reaffirm its consistent jurisprudence, according to which any “compelling reason” can lead it to reject a request for an advisory opinion. The court may also confirm the absolute right of the General Assembly to determine the usefulness of an opinion in the light of its own needs. It is, hence, held that it would not consider the origin or political narrative of the request, or the distribution of votes underlying the adopted resolution.

While determining the legality or illegality of the threat of use of nuclear weapons, the court came to the conclusion that the provisions of the UN Charter relating to the threat or use of force, the principles and rules of IHL that form part of the law that applies to armed conflict, the law of neutrality, and any other significant treaties on nuclear weapons are the ones that are most significantly applicable to the law that governs the question put up by the General Assembly. In applying this law, the court considered it crucial to take into account certain unique characteristics of nuclear weapons, in particular their destructive capacity, which can cause immense human suffering for generations to come. The ICJ referred to nuclear weapons to be unique because they release combinations of immensely powerful blast waves, intense heat in the form of thermal radiation, and high amounts of ionized radiation. Their detonation also creates residual radioactive particles (so-called nuclear fallout) with the potential to spread over great distances.

27. *Ultra vires* is a Latin phrase meaning “beyond the powers”.

These features give nuclear weapons the capacity for incredible destructive power, and severe and widespread consequences for human health, civilian structures and the environment. On the basis of these observations, the court had concluded that the use of nuclear weapons would “**generally be contrary to the rules of international law applicable in armed conflict, and in particular the principles and rules of humanitarian law**”. However, the court could not determine completely whether the use of nuclear weapons would be unlawful in all circumstances or not. Hence, whether it is legal to deploy nuclear weapons in “an extreme case of self-defence in which the very survival of a state would be at stake, is still a question that remains unresolved.”

OVERVIEW OF THE OPINION

The advisory opinion on the Legality of the Threat or Use of Nuclear Weapons issued by the ICJ on the July 8, 1996, has been one of the landmark legal opinions which stated that there is no such source of customary or treaty law, which specifically outlaws the use or possession of nuclear weapons. Initially, the World Health Organisation (WHO) had requested the opinion on September 3, 1993, but based on the principle of *ultra vires*, this request was dismissed by the ICJ as WHO was acting outside its legal boundaries. Later on, the UN General Assembly requested another opinion in December 1994, which was finally accepted by the ICJ in January 1995. Apart from assessing the legitimacy of the threat or use of nuclear weapons in an armed conflict, the court also discussed the appropriate role of the international judicial bodies, the ICJ’s advisory function, IHL (*jus in bello*),²⁸ and rules governing the use of force (*jus ad bellum*).²⁹

On the July 8, 1996, the ICJ delivered its advisory opinion, under General List No. 95, “Legality of the Threat or Use of Nuclear Weapons”, in response to UN General Assembly Resolution 49/75 K, adopted on December 15,

28. International Humanitarian Law, or *jus in bello*, is the law that governs the way in which warfare is conducted.

29. *Jus ad bellum* is a set of criteria that is to be consulted before engaging in war in order to determine whether entering into war is permissible, that is, whether it is a just war (ICRC).

A threat or use of nuclear weapons must be compatible with the requirements of the international law applicable in situations of armed conflict specifically with the principles and rules of International Humanitarian Law, as well as with obligations under all international mechanisms exclusively dealing with nuclear weapons.

1994³⁰. The main question around which it centred was: "Is the threat or use of nuclear weapons in any circumstance permitted under international law?"

The international community of nations has considered this matter one of great significance. This was understood from the fact that almost 22 states presented their verbal submissions before the court, along with 43 other states that had already submitted written material. This advisory opinion is of great importance for the international community for various reasons. Firstly, because this was for the first time that this supreme judicial body centring the international legal regime

addressed the fundamental concern about the legal status of nuclear weapons in international law. Secondly, this opinion not only engaged one of the most debatable political issues of modern international law but can also be seen as an important example of the court's judicial independence within the UN system, and the degree to which it might have been vulnerable to political burden from states in a promptly evolving international environment³¹.

The ICJ on issuing its advisory opinion on the Legality of the Threat or Use of Nuclear Weapons, unanimously decided:

- that neither the customary law nor the conventional international law, authorise the threat or use of nuclear weapons,
- according to Article 2(4) and Article 51 of the UN Charter, the threat or use of nuclear weapons is unlawful,
- A threat or use of nuclear weapons must be compatible with the requirements of the international law applicable in situations of armed

30. Jasjit Singh, "Re-examining the 1996 ICJ Advisory Opinion", *Calmus: Promoting Leadership in Thought That Leads to Action*, vol. no. 5, October 2005.

31. n.12.

conflict specifically with the principles and rules of International Humanitarian Law, as well as with obligations under all international mechanisms exclusively dealing with nuclear weapons.

- States are required to conclude in good faith the negotiations that would lead to nuclear disarmament.
- By eleven votes to three, it was found by the court that neither in any customary law, nor conventional international law, is there any comprehensive and universal prohibition of the threat or use of nuclear weapons as such.
- **IN FAVOUR:** President Bedjaoui; Vice-President Schwebel; Judges Oda, Guillaume, Ranjeva, Herczegh, Shi, Fleischhauer, Vereshchetin, Ferrari Bravo, Higgins;
AGAINST: Judges Shahabuddeen, Weeramantry, Koroma.³²
- Lastly, one of the most debatable parts of the opinion was that by seven votes to seven and with a casting vote of the president, the court held that the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict, and, in particular, the principles and rules of humanitarian law.³³

The court could not come to a definite conclusion about the lawfulness of the threat or use of nuclear weapons in an extreme circumstance of self-defence, in which the very survival of a state would be at stake.

However, according to the present state of international law, and of the elements of fact at its disposal, the court could not come to a definite conclusion about the lawfulness of the threat or use of nuclear weapons in an extreme circumstance of self-defence, in which the very survival of a state would be at stake.

32. Ibid.

33. Ibid., p.23.

THE REQUEST SUBMITTED TO THE COURT BY THE GENERAL ASSEMBLY

Is the threat or use of nuclear weapons in any circumstances permitted under international law?

Firstly, the court didn't reply to this question in the form in which it was submitted by the UN General Assembly, but instead reformed the question to some extent while keeping in mind the real objective behind the question. Although the court is obliged to answer the question in the form it was submitted to the court by the General Assembly, it was also the duty of the court to "ascertain what are the real legal questions formulated in a request. This duty is based on the responsibility of the court to contribute to the good functioning of the international organisations and to be able to give a reply that is both useful and conforming to the judicial role of the court. Hence, the newly drafted question that was attempted to be answered by the court was:

Is the threat or use of nuclear weapons legal or illegal in any circumstances?

While determining the legality or illegality of the threat or use of nuclear weapons, the court decided that the most directly relevant applicable law governing the General Assembly's question consisted of the provisions of the UN Charter relating to the threat or use of force, the principles and rules of IHL that form part of the law applicable in armed conflict and the law of neutrality, and any relevant specific treaties on nuclear weapons. In applying this law, the court considered it imperative to take into account certain unique characteristics of nuclear weapons, in particular their destructive capacity, which can cause untold human suffering for generations to come.

According to the ICJ, nuclear weapons were "explosive devices whose energy results from the fusion or fission of the atom". The only two factors that could distinguish nuclear weapons from any other weapon were identified: first, the immense powerful release of heat and energy caused by the fusion or fission of the atom; and, second, the phenomenon of radiation associated

with that process. The ICJ mentioned that “such characteristics render the nuclear weapon potentially catastrophic.” The massively disastrous power of nuclear weapons is capable of destroying “all civilization and the entire ecosystem of the planet.” The ICJ also mentioned the detrimental impact that radiation has on the current and future state of health, agriculture, the environment, natural resources, and demography.

It is worth mentioning here that in most of the disarmament and non-proliferation agreements, there is a lack of a proper definition of nuclear weapons due to the technical complications inherent in the process. Initially, an advisory opinion was requested for nuclear weapons as weapons of mass destruction, but the court’s advisory opinion encompassed all kinds of nuclear weapons that have catastrophic consequences on populations. As indicated by the ICJ, nuclear weapons are excessively ruinous on the grounds that they discharge great impact waves, extraordinary heat in the form of thermal and ionized radiation. Their explosion additionally makes the remaining radioactive particles (alleged atomic aftermath) spread over massive areas.

These characteristics give nuclear weapons the immense destructive power that results in negative outcomes for human well-being, regular citizen structures and the environment. Studies have demonstrated that the explosion of a nuclear weapon would cause widespread death, damage and harm, particularly if it blasts in a populated territory. There would be massive loss of lives resulting from severe burns and trauma that would occur amongst the people of the victim country in the aftermath of the nuclear detonation. As these effects cause fuel and flammable substances to explode or burn, fires and firestorms are also likely to develop, creating large numbers of additional casualties as a result of which people outside the immediate area of the blast would face an increased risk of developing certain cancers such as leukaemia and thyroid cancer, which may manifest themselves decades later .

TEXT OF THE OPINION

After finding that it was competent under the terms of Article 96 of the UN Charter to give an advisory opinion on a legal question placed by the General

As indicated by the ICJ, nuclear weapons are excessively ruinous on the grounds that they discharge great impact waves, extraordinary heat in the form of thermal and ionized radiation. Their explosion additionally makes the remaining radioactive particles (alleged atomic aftermath) spread over massive areas.

Assembly, and that there were no “**compelling reasons**” for it to refuse providing such an opinion, the court subsequently handed down its advisory opinion on July 8, 1996. With a view to explore the existing principles or laws that might be relevant to the request for an advisory opinion on the legality of the threat or use of nuclear weapons, the ICJ carried out a three-part analysis. First, it considered the general rules and principles; then it examined the UN Charter; and, ultimately, it focused on the regulations relevant in armed conflict situations. These are briefly discussed below:

General Rules and Principles

While trying to answer the inquiry put to it by the General Assembly, the court decided after consideration of the great corpus of international law norms accessible to it, on what might be the appropriate international law. The court first examined the Right to Life as guaranteed through Article 6, paragraph 1 of the International Covenant on Civil and Political Rights (ICCPR). In this connection, the court also considered the question whether a specific death toll, or casualty as a result of the use of a certain weapon in warfare, is to be viewed as an arbitrary deprivation of life or not in the light of what is noted in **Para 1 of Article 6 of the 1966 International Covenant on Civil and Political Rights** that stated:

Every human being has the right to life. This right shall be protected by law. No one shall be arbitrarily deprived of (his) life.

But the treaty is then declared not relevant: although human rights law applies even in war-time, and the right to life cannot be suspended

by operation of Article 4 of the covenant under any circumstances, the question of what constitutes an arbitrary deprivation of life can be decided only by reference to the applicable *lex specialis*,³⁴ namely, International Humanitarian Law.³⁵ Apart from that, the court also attempted to call attention to whether the prohibition of genocide would be applicable in this situation if the decision to use nuclear weapons did indeed necessitate the element of intent, towards a group as such, required by Article II that lists acts “committed with intent to destroy, in whole or in part, a national, ethnic, racial or religious group, as such” of the 1948 Convention on the Prevention and Punishment of the Crime of Genocide. It may be recalled that this particular convention has within its obligations those components that do not authorise the threat or use of nuclear weapons as stated in the unanimous Clause I of the ICJ judgement.

The court provides that nuclear weapons are particularly disastrous because their capacity “to destroy all civilization and the entire ecosystem of the planet” can cause untold human suffering, excessive damage to future generations and irreparable damage to the environment.

After its declared prohibition on genocide to be suitable under the Law of Intent, the court then undertook a detailed examination to find out the relation between the existing international law and the protection and safeguarding of the environment. As indicated by the court, though international law does not particularly preclude the use of nuclear weapons in relation to the protection of the environment, it emphasises that important environmental factors should be taken into account in the implementation of IHL. Therefore, it is certain that widespread and long-lasting damage to the environment resulting from the use of nuclear weapons is a favourable argument in condemning the use of nuclear weapons.

In the last part of the General Rules and Principles or the Applicable Law, the apex court goes on to describe the “unique characteristics of nuclear

34. *Lex specialis*, in legal theory and practice, is a doctrine relating to the interpretation of laws and can apply in both domestic and international law contexts (ICRC).

35. Stefaan Smis and Kim Van der Borghi, “The Advisory Opinion On The Legality Of The Threat.” n.d. p.376.

weapons". These unique characteristics of nuclear weapons are then examined in relation to the General Rules and Principles or the applicable law, the main components of which, as indicated by the court, are the provisions of the UN Charter relating to the use of force, and IHL. While going on to describe the salient features of nuclear weapons, the court provides that nuclear weapons are particularly disastrous because their capacity "to destroy all civilization and the entire ecosystem of the planet" can cause untold human suffering, excessive damage to future generations and irreparable damage to the environment.

After analysing the first part of the advisory opinion on the general rules and principles, the court inferred that the most significant applicable laws administering the questions related to the use of force were the ones referred in the UN Charter along with the law applicable in armed conflict (LoAC) which regulates the conduct of hostilities, together with any specific treaties on nuclear weapons that the court might determine to be applicable.

The UN Charter

After examining the unique characteristics of nuclear weapons, the World Court then addressed the question of the legality or illegality of recourse to nuclear weapons in the light of the provisions of the UN Charter relating to the threat or use of force. In this context, the court considered the provisions of the UN Charter relating to the threat or use of force. Although Article 2, paragraph 4 (generally prohibiting the threat or use of force), Article 51 (recognising every state's inherent right of individual or collective self-defence if an armed attack occurs) and Article 42 (authorising the Security Council to take military enforcement measures)³⁶ do not refer to specific weapons, the court held that they apply to any use of force, regardless of the type of weapon employed. The court observed that the UN Charter neither expressly prohibits nor permits the use of any specific weapon, including nuclear weapons, and that a weapon that is already unlawful by an international treaty or custom does not become lawful by the reason

36. n.16.

of being used for a legitimate purpose under the UN Charter. Regardless of the means of force used in self-defence, the dual customary principles of necessity and proportionality and the law applicable in armed conflict apply, including such further considerations as the very nature of nuclear weapons and the profound risks associated with their use. To elaborate a bit more on the proportionality principle, it can be noted that though this principle itself does not exclude the use of nuclear weapons in self-defence in all circumstances, the use of force that is proportionate under the law of self-defence must meet the requirements of the Law of Armed Conflict that comprises principles and rules of humanitarian law, in order to be lawful. The court also points out that the high risks associated with all nuclear weapons due to their very nature should be remembered by the states that believe that they can exercise a nuclear response in self-defence in accordance with the principle of proportionality. Hence, the principle of the UN Charter clearly states that the threat or use of force is prohibited if it is directed against the territorial integrity or political sovereignty of any state, or if it is in any other manner inconsistent with the purposes of the United Nations.

Regulations Relevant in Armed Conflict: International Humanitarian Law

After examining the provisions of the UN Charter relating to the threat or use of force, the court looked at the law that applies during situations of armed conflict. First, it addressed the question regarding the specific rules in international law that regulate the legality or illegality of taking recourse to nuclear weapons and then it examined the principles and rules of IHL applicable in an armed conflict, and the law of neutrality, after which the court concluded, in its own words:

The Charter neither expressly prohibits nor permits the use of any specific weapon, including nuclear weapons.³⁷

37. Smis and der Borghi, n.35.

It noted that the international law does not contain any specific provision that authorises the threat or use of nuclear weapons or any other weapon in general or in certain circumstances, particularly while exercising self-defence. Since self-defence may be the only legitimate basis for taking recourse to force, the legality or illegality of the use of nuclear weapons will, in the first instance, be established on the basis of conformity with the elements of proportionality, necessity, and the rules of *jus in bello*, especially the principles and rules of humanitarian law with which the use of force in self-defence must comply.

Subsequent to inferring that no customary or conventional rule of general degree could be discovered, particularly precluding the threat or use of nuclear weapons, the court swung to the topic of whether the rules and principles of IHL applicable in armed conflict and the law of neutrality would permit the use of nuclear weapons. The Law of War or of armed conflict had existed right from the beginning of human civilization. These rules had, in turn, given rise to a number of prevalent customary laws. To see if the customary laws had provisions or not to prohibit the use or threat of nuclear weapons the ICJ reviewed a number of historical sources. Then, it declared that the Hague Law and Geneva Law together incorporate International Humanitarian Law (IHL).

This corpus of law was to be observed by all the states irrespective of whether they had ratified or not the conventions that contained them because “the great majority of [humanitarian law] had already become customary” when the conventions were ratified. Moreover, despite keeping nuclear weapons aside during the international law conferences of 1949 and 1974 to 1977,³⁸ the court was of the opinion that the principles and rules of humanitarian law are equally applicable to nuclear weapons and, hence, it inferred that the use of nuclear weapons would be incompatible with the humanitarian character of the legal principles laid out under the IHL. The assurance provided by the Marten’s clause³⁹ confirms the righteousness

38. Diplomatic Conference on the Reaffirmation and Development of International Humanitarian Law Applicable in Armed Conflicts

39. Rupert Ticehurst, “The Marten’s Clause and the Laws of Armed Conflict.” International Committee of the Red Cross, April 30, 1997, <https://www.icrc.org/eng/resources/documents/article/other/57jnhy.htm>. Accessed in August 2018.

of the court's decision. The court further highlighted five key concepts of humanitarian regulations that are applicable during an armed conflict for further dialogue. These are:

- Principle of distinction between combatants and non-combatants.
- Prohibition of indiscriminate weapons.
- Prohibition concerning the use of weapons that give rise to unnecessary human suffering or the principle of humanity.
- The principle limiting the means to wage war.
- The prohibition regarding use of weapons that violate the neutrality of non-participating states.

The Principle of Discrimination Between Combatants and Non-Combatants

According to the court, the primary principle is "geared toward the protection of the civilian population and civilian objects." It, consequently, makes a distinction between combatants and non-warring parties. The court, in this context, reaffirms the value of this customary rule that has been the object of various instruments, including Articles 25 and 27 of the Hague Regulations of 1907, General Assembly Resolution 2444 (XXIII) of December 18, 1968, and Article 48 of Additional Protocol I of 1977.

The Prohibition Regarding the Use of Indiscriminate Weapons

As indicated by the court, the states can in no way target civilians as objects of assault, and should, consequently, by no means, use weapons which can be incapable of distinguishing between combatants and non-combatants. This rule is similar to that enunciated in Article 51 paragraphs 4 and 5 of Additional Protocol I. It was important that the court confirms the customary value of the rule because only one instrument expresses this rule and Additional Protocol I has not been ratified by all the states.

The Prohibition Regarding Use of Weapons that Cause Unnecessary Suffering or Aggravate Suffering

As indicated by the court, weapons that cause harm or unnecessarily

increase suffering are prohibited. The court's attention to this principle is worthwhile of the advisory opinion. However, there were some doctrinal discrepancies, for example, the court could not provide a standard for assessing whether the "use of a weapon is causing unnecessary suffering or superfluous injury."⁴⁰

The Principle Limiting the Means to Wage War

In order to talk about the powerful means of addressing the rapid evolution of military technology the court referred to the Marten's clause;⁴¹ this clause had initially appeared in the Preamble of the 1899 Hague Convention respecting the Laws and Customs of War on Land (1899 Hague II) and in the Hague Convention of 1907. According to the court, Article 1, paragraph 2 of Additional Protocol I to the Geneva Conventions of 1949, a modern version of the clause provides, "*In cases not covered by this Protocol or by other international agreements, civilians and combatants remain under the protection and authority of the principles of international law derived from established custom, from the principles of humanity and from the dictates of public conscience.*"⁴²

This implies that civilians and combatants remained under the protection and authority of the principles of international law derived from established custom, the principles of humanity and the dictates of public conscience, even if some element of prohibition is missing in the protocol.

The Prohibition Regarding Use of Weapons that Violate the Neutrality of Non-Participating States

On the principle of the prohibition regarding the use of weapons that violate the neutrality of non-participating states, the court proclaimed that just

40. Robin M Coupland, surgeon, "Abhorrent Weapons and Superfluous Injury or Unnecessary Suffering: From Field Surgery to Law," *thebmj*. November 29, 1997. <https://www.bmj.com/content/315/7120/1450>.

41. The text of the Marten's clause in the Hague Convention IV reads as follows: "Until a more complete code of the law of war has been issued, the High Contracting Parties deem it expedient to declare that, in cases not included in the regulations adopted by them, the inhabitants and the belligerents remain under the protection and the rule of the principles of the law of nations, as they result from the usages established among civilized peoples, from the laws of humanity, and the dictates of the public conscience".

42. Smis and der Borghi, n.35.

like the principles of humanitarian law are appropriate in cases of armed conflict, the principle of neutrality,⁴³ irrespective of the content and similar to the fundamental character of the international humanitarian law shall be applicable in any or all international armed conflict, regardless of the types of weapons used.

Apart from establishing the relevance of the fundamental principles and rules of international humanitarian law that is applicable in all cases of international and non-international armed conflicts, the apex court had also concluded that the use of nuclear weapons by any state (assuming that the use is for the purpose of self-defence) must comply with certain standards established by the court.

Response of States

In a response to the advisory opinion furnished by the ICJ, the participating nuclear-armed states essentially stated that no aspect of the opinion requires them to change their policies. The United States further noted that the court *“declined to pass on the policy of nuclear deterrence”* and both the US and France incorrectly asserted that the *“opinion indicates that the use of nuclear weapons in some circumstances would be legal.”* But the truth is that the apex court only stated its incapability to decide the matter in certain possible circumstances and stressed that the states must always comply with rules that protect civilians from the inhumane and devastating effects of warfare. The UK commented, *“Like the court, we believe that the use of nuclear weapons would be considered only in self-defence in extreme circumstances.”* Thereafter, the Government of the UK had planned to renew the only British nuclear

43. The principle of neutrality, in its classic sense, was aimed at preventing the incursion of belligerent forces into neutral territory, or attacks on the persons or ships of neutrals. Thus: (1) *“the territory of neutral powers is inviolable.”* Hague Convention (V) Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land, Oct. 18, 1907, art. 1; 2) *“belligerents are bound to respect the sovereign rights of neutral powers...”* Hague Convention (XIII) Respecting the Rights and Duties of Neutral Powers in Naval War, Oct. 18, 1907, art. 1; 3) *“neutral states have equal interest in having their rights respected by belligerents...”* Convention on Marine Neutrality, Feb. 20, 1928. Clearly, the *“principle of neutrality applies with equal force to trans-border incursions of armed forces and to the trans-border damage caused to a neutral state by the use of a weapon in a belligerent State.”*

Despite reaching an agreed decision about the applicability of humanitarian principles on the use or threat of nuclear weapons, there is still a great deal of debate surrounding these conclusions.

weapon, the Trident missile system.⁴⁴ On December 19, 2005, it had published a White Paper “**The Future of the United Kingdom’s Nuclear Deterrent**”, by Rabinder Singh QC and Professor Christine Chinkin of Matrix Chambers, where, in relation to the advisory opinion of the ICJ, Singh and Chinkin had argued, “*The use of the Trident system would breach customary international law, in particular because it would infringe the ‘intransgressible’ [principles of international customary law] requirement that a distinction must be drawn between combatants and non-combatants*”.⁴⁵ Russia observed that the opinion “*reflected a complex, mostly political role of nuclear weapons in the modern world.*”⁴⁶

States of the Non-Aligned Movement, in particular Indonesia and Malaysia, had led the campaign to obtain a General Assembly majority in favour of asking the court for its opinion. They emphasised on the unanimous conclusion given by the court in the context of the disarmament obligation in a resolution that had been put forward by Malaysia during the fall of 1996 and adopted annually. Since then,⁴⁷ the General Assembly highlighted the conclusion and called on all the states to comply with the obligation by immediately commencing multilateral negotiations, leading to the early conclusion of a convention prohibiting and eliminating nuclear weapons. The resolution received a considerable number of opposing votes and abstentions, due to the position of states such as Japan that the negotiation

44. Memoranda on the Future of the UK’s Strategic Nuclear Deterrent: The White Paper to the House of Commons Defence Committee

45. Rabinder Singh and Christine Chinkin, “The Maintenance and Possible Replacement of the Trident Nuclear Missile System Introduction and Summary of Advice Archived”, 2013-01-13 at Archive.is for Peace rights (paragraph 1 and 2)

46. John Burroughs, “Looking Back: The 1996 Advisory Opinion of the International Court of Justice, Arms Control Today,” Arms Control Association, August 2016. https://www.armscontrol.org/ACT/2016_07/Features/Looking-Back-The-1996-Advisory-Opinion-of-the-International-Court-of-Justice. Accessed on August 30, 2018.

47. Linh Schroeder, “The ICRC and the Red Cross and Red Crescent Movement: Working Towards a Nuclear-Free World,” *Journal for Peace and Nuclear Disarmament*, 2018.

of the convention was premature. However, when the paragraph welcoming the court's statement of the disarmament obligation was voted on separately, it was approved by an overwhelming majority, not including France, Israel, Russia, the UK, and the United States.

CONCLUSION

Despite reaching an agreed decision about the applicability of humanitarian principles on the use or threat of nuclear weapons, there is still a great deal of debate surrounding these conclusions. While some states are of the opinion that use of low yielding nuclear

weapons in areas of sparse population might comply with the humanitarian standards of IHL, other states opine that the use of nuclear weapons under all circumstances is completely incapable of distinguishing between warriors and non-warriors or civilians and also between civilian objects and military objectives. Furthermore, the attacks will be far from being confined to the military units of a nation; rather, the detonations would result in uncontrollable destruction of human life due to the powerful blast waves and heat radiation often accompanying a nuclear explosion.⁴⁸ On being hesitant to take an agreed position on the threat or use of nuclear weapons by states, the apex court reaffirmed, in reference to the core principles of IHL, that any tactics of warfare that fail to distinguish between civilians and military targets, causing unnecessary suffering to combatants and civilians, are prohibited. However, the court lacks the ability to prove with certainty that the use or threat of nuclear weapons would necessarily disagree with the fundamental rules and principles of IHL. The ICJ had taken a very conservative approach while furnishing the advisory opinion on the threat

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48. Jha, n.4

or use of nuclear weapons that was requested by the General Assembly in 1995.

After analysing all the relevant international mechanisms, including the basic principles of IHL and the provisions on self-defence under the UN Charter and establishing humanitarian standards for the threat or use of nuclear weapons to comply with them, the apex court came to the conclusion that the threat or use of nuclear weapons might contradict the principle rules and regulations of IHL or LoAC. However, the court failed to determine with certainty whether the threat or use of nuclear weapons by states would be legal or not in extreme cases of self-defence, when the very survival of the state would be at stake.

Nevertheless, keeping aside the demerits of the 1996 advisory opinion by the ICJ, it can be safely agreed that this opinion has thrown light on some very relevant points such as: it has been universally accepted since the furnishing of the opinion that the use of nuclear weapons by states is disgraceful and a crime against humanity and, hence, the states in possession of nuclear weapons should gradually proceed towards total disarmament. Secondly, though there is still a lack of an agreed decision on the lawfulness of the threat or deployment of nuclear weapons in extreme cases of self-defence, it is clear from the opinion of the court that the use of nuclear weapons under any circumstances cannot comply with the humanitarian principles of the LoAC. It is also still not clear as to how nuclear weapons can be used without violating the international environmental laws. However, the opinion rendered by the court finally helped in establishing customary rules under the humanitarian law that would be applicable to any present and future weapon that intends to destroy humanity.