

# AIR POWER

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## Contributors

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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.

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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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## ➤ EDITOR'S NOTE

The COVID-19 pandemic dominated news during the quarter just gone by.

By the end of the first quarter, India had gone into a nationwide lockdown with about 1,400 cases and 35 deaths recorded. Unfortunately, the situation has not eased, and India has recorded a total of 566,840 cases and about 17,500 deaths by June 30, with no signs of the 'curve flattening out'—usually an indication that the spread of the virus is being brought under control. By contrast, China—which has been held responsible for the spread of the coronavirus globally—has had a little over 83,000 cases, recording about 4,600 deaths so far. Of course, there is no way of confirming these figures, coming as they are from the State-controlled media in China. Recent indications are that there has been a fresh resurgence of the pandemic in China with the capital city going into a lockdown once again.

The debate over the origin of the virus has intensified worldwide. Independent Science News (that covers global events relating to health, food and agriculture), in a recent article ('The Case is Building that COVID-19 had a Lab Origin'; June 2, 2020), discussed the lab escape theory convincingly. It posits that of the two labs that are close to each other in Wuhan, one is a Biosafety Level 4 (BSL-4) facility, i.e., the Wuhan Institute of Virology (WIV), while the other, the Wuhan Center for Disease Prevention and Control (WCDPC) is a BSL-2 lab that is just 250 metres away from the Huanan live animal market. ISN goes on to suggest that since bat coronaviruses have been kept in the WCDPC in the past, the possibility of the virus escaping from the lab cannot be ruled out. Although BSL-4 is the highest pathogen security level for a lab, a visit by US Embassy officials to the WIV Lab as early as in 2018 are believed to have raised concerns 'about biosecurity'.

The European Commission has blamed China for the dissemination of fake news and misinformation about the spread of Covid-19 in the EU and globally. In another development related to China's likely role in covering up the information relating to the spread of the Covid-19 outbreak, major newspapers in Germany are known to have prepared an invoice for 149 billion Euros—the amount China owes Germany due to the impact of the coronavirus pandemic.

The US has been extremely vocal about blaming China for the spread of the coronavirus pandemic; others, including Britain, Germany and Australia have also joined the US in blaming China.

The ongoing riots in Hong Kong—and the Communist Party of China's (CPC) seeming inability to deal with the situation with a heavy hand, lest it receives international opprobrium—forced the leadership in China to think of new ways to skin the cat. At literally the eleventh hour before the end of the quarter (at 2300 hrs on June 30), President Xi Jinping signed the controversial Security Law that enables punishing protesters in Hong Kong with up to a maximum sentence of a lifetime in prison, besides permitting 'a few' being sent to mainland China for trial. Pro-democracy operations were known to have ceased immediately after the new law came into force. The move has been seen by nations as a violation of the 'One country two systems' principle. While this action by Xi Jinping would have strengthened his domestic image, it sure has alienated China from most nations across the developed world. Of course, this is no skin off China's back!

With nations finding China to be an unreliable partner as far as coming clean on the Covid-19 crisis is concerned, most member nations of the BRI have stopped China from continuing its BRI projects in their countries. The fallout of stoppage/slowdown of the BRI—its flagship project—on China's economy, has been significant.

Another factor that has impacted the economy is the displacement of migrant labour once factories were shut down in China. This, along with the lack of funding for the MSME sector in China—that accounts for almost 60 percent of China's GDP—have derailed its economy significantly, and

are likely to impact Xi Jinping's move towards achievement of the China Dream.

China's neighbours in the South/East China Sea regions—Vietnam, the Philippines, Indonesia, Malaysia and Japan—have recently lodged official protests at the bilateral level as well as with the UN for various acts of 'bullying' and high-handedness by the Chinese Coast Guard (CCG)/Maritime Militia (CMM). The CCG and CMM, along with some survey vessels of China, were responsible for sinking a Vietnamese fishing vessel in April and attacking another near Paracel islands in June; engaging in a stand-off with a Malaysian vessel that was prospecting off the coast of Borneo in an authorised manner; sending its coast guard vessels into Japanese territory near the disputed Senkaku islands repeatedly, etc. China has also been upping the ante against those nations that have sought an inquiry into the origin of the coronavirus, holding China accountable for its spread worldwide. In the Indo-Pacific region, Australia has felt the brunt of China's backlash when it faced a string of sophisticated cyberattacks from China.

It can thus be seen that China is being 'targeted' on various fronts, mostly for events and misdemeanours of its own making. In some cases, to maintain a modicum of face-saving in front of its domestic audience, the Chinese leadership has been forced to take belligerent actions as far as international relations are concerned.

One such action taken by China was to block Taiwan's entry to the World Health Assembly (virtual) meeting in May and stepping up military drills around the island by sailing its aircraft carrier, the Liaoning, around the island nation. With indications from Taiwan's Ministry of National Defence that China could set up an ADIZ over the South China Sea shortly, it appears that the PRC is playing to a plan in its efforts to dominate the South China Sea—the area that falls within the Nine Dash Line—besides its ongoing attempts at Finlandisation of its neighbouring states.

The US, however, reacted in a most unexpected (for China) manner to come to the support of the nations being bullied by China in the South China Sea region. Despite news that most of the crew aboard its aircraft carrier,

the USS Theodore Roosevelt, was affected by Covid-19—thereby effectively rendering the ship non-operational alongside at Guam—another carrier, the USS Ronald Reagan, completed its period of quarantine and refit at Yokosuka in Japan and was ready to sail into the South China Sea in the Western Pacific as a mark of solidarity. It is likely to be joined by another aircraft carrier—the USS Nimitz—in a twin carrier group operation in the South China Sea. This would send the necessary signal to China that the US is not about to relinquish its responsibilities towards its friends and allies in the South East and East Asian region. China was possibly blindsided by this action as it had hoped that it could coerce Taiwan into submission during the period that the US was fighting the pandemic within its borders. This resolute action follows the signing into Law of the Taiwan Allies International Protection and Enhancement Initiative (TAIPEI) Act by President Trump on March 26, 2020 which requires the United States to ‘alter engagement with countries that undermine Taiwan’s security or prosperity’.

Another action by the Chinese was to disturb the peace and tranquillity that existed along its border with India for 45 years by carrying out a most shameful act on June 15—that could best be described as ‘barbaric’—when it killed 20 Indian soldiers in cold blood at the Galwan Valley. The PLA had been building infrastructure in the areas opposite Eastern Ladakh ever since Xi Jinping came to power in March 2013. In his opening directives to the PLA, Xi had emphasised that it should not spare any effort to ‘defend China’s territorial integrity and core interests’. It will be recalled that on April 16, 2013, the earliest ‘face-off’ in the region of Ladakh was in the region of Daulat Beg Oldi where the PLA had, with renewed vigour, encroached 19 km inside what India considers its side of the LAC in the Depsang Plains. This action preceded the visit to India by Chinese Premier, Li Keqiang from May 19 to 22, 2013. The Chinese believe in coercive diplomacy, backed by the strength of its military. In this case, the intrusion and the ‘tough’ stand taken by the Chinese in their diplomatic parleys with their Indian counterparts to defuse the situation was meant to influence the Indian leadership into accepting the Chinese agenda during the meeting of the two Premiers. Forty PLA soldiers had pitched their

tents and refused to budge for three weeks, during which hectic diplomatic parleys were afoot on both sides to restore the 'status quo ante'—a term that meant that the PLA soldiers would remove their tents and leave. But would they 'vacate' the 19 km they had 'intruded' into Indian territory in the Depsang plains? It was believed that 'political and diplomatic sagacity' had won.

But was it really so?

Although the Chinese did withdraw their troops, but not before arm-twisting India to first demolish its tin sheds (over the hardened bunkers) at Chumar—legitimately on the well-established Indian side of the LAC—just because these overlooked Chinese positions in the region. Also, the recent operationalising of ALGs by India at DBO, Fukche and Nyoma could have irked the Chinese somewhat.

A year later, during the first official visit by President Xi Jinping to India from September 17 to 19, 2014, the Chinese began building a road from their side of the LAC towards Chumar in the Demchok sector. When this was challenged by the Indian soldiers, the PLA gathered in strength and both armies were eyeball to eyeball for sixteen days. The situation was defused with the Chinese agreeing to stop building the road; in return, India agreed to stop building observation posts on the Indian side at Chumar. There were reports of an attempt by some elements in the PLA that were believed to have taken this action unilaterally to 'embarrass' the Chinese President during his official visit to India for his recent actions against military leaders involved in corruption cases. With Xi Jinping also being the Chairman of the Chinese Military Commission, such reports could be considered baseless; 'coercive diplomacy' was once again on display, as it would certainly have had the clearance of the Chinese leader. The Chinese leader's anticipated response to the events on the LAC was that the boundary between the two countries is not well-defined and which could lead to the occasional tensions at the LAC. The visit, however, did not achieve the predicted objective for India in securing a US\$ 100 billion investment from China; the visit ended with barely US\$ 20 billion being agreed to by the Chinese leader for developing infrastructure projects in India over the next five years. The Chinese plan had worked once again.



China had strong objections to India building the Darbuk-Shyok-DBO road—that passes close to the Galwan Valley—as it would facilitate the Indian Army to build up troops and supplies to the DBO sector which is close (barely 15 km) from the Karakoram Pass, a strategic area for China. [Does India ever object to the NH-219 that passes through Aksai Chin—an area that was once Indian territory—and other similar roads built by the Chinese over the years in areas close to the LAC?] Also, in this sector, the LAC is not clearly demarcated. The Chinese state this in their defence and took advantage of this fact to build infrastructure along the Galwan river. When they were challenged by the Indian Army on June 15, 2020, the PLA attacked the Indian Army personnel with batons that had spikes embedded in them—a most primitive but lethal tool for hand-to-hand fighting. Twenty Indian Army soldiers were killed—in cold blood—including the Commanding Officer, Colonel Santosh Babu. The Indian Army unit retaliated and came out in large numbers to avenge the death of their CO. In the ensuing hand-to-hand combat it is believed that the Chinese suffered a large number of casualties, although they have not acknowledged this fact; they never expected such a strong reaction from the Indian side. This was the first time in 45 years that casualties had been caused on both sides along the LAC.

The biggest casualty of this event, however, was 'Trust', which was broken, especially after it emerged that this was not a spontaneous reaction by the Chinese, but a premeditated activity. The Digital Strong Innovation Team from Australia has recently stated that the PLAAF was involved in a sand model discussion on exactly the scenario that emerged on June 15; only, that the exact replica of the Area of Operations was 2,500 km to the East of Galwan. Also, the sand model discussion took place almost a decade ago.

This goes to show that the build-up of forces and infrastructure in the Galwan Valley was according to a well-calibrated plan; also, the brutal means used to kill and maim Indian soldiers was done by forces 'not the usual ones that the Indian troops recognised'.

The PLA is known to have also carried out exercises to capture airfields and 'passes' at high altitudes with special forces during the STRIDE series of exercises along with the PLAAF for the last one decade.

'Capture passes'? One does not need to capture 'passes' and airfields at high altitudes in a Taiwan contingency; the practices were obviously aimed at a future confrontation with India.

Of greater significance is the eighth edition of the SHAHEEN series of exercises between PAF and PLAAF that were held in 'the region adjoining Ladakh'. This was as involved an exercise as one can imagine—complete with DACT, AWACS, Special Forces, Red versus Blue large force engagements, and others. The only difference was that it was held in the 'likely area of operations for a future conflict where a two-front dilemma could have been posed to India'. That the practised scenario almost became a reality is a chilling reminder about the designs that our adversaries harbour against the Indian state—triggered into overdrive possibly by the declarations of August 5, 2019.

It was only due to the alacrity of the Indian Army and the timely forward deployment of the IAF that any serious developments were avoided. Of course, diplomacy played an important part in defusing the situation.

It appears that the advantage that China was seeking under the Covid-19 umbrella has backfired; India needs to remain vigilant and literally 'pull out all stops' to ensure 'not an inch of its territory' is ever lost. Also, diplomatic and economic action against China merits a fresh look.

Meanwhile, it is important that you all STAY SAFE, STAY HEALTHY, STAY CHEERFUL in these troubled times.

Happy reading.



# AIR POWER IN NO WAR- NO PEACE SCENARIO

**RAJNATH SINGH**

Chief of Defence Staff Gen Bipin Rawat, Chief of the Naval Staff Admiral Karambir Singh, Air Chief Marshal RKS Bhadauria, Chief of the Air Staff, Dr. G Satheesh Reddy, Chairman DRDO and Secretary Research and Development, Air Marshal KK Nohwar, DG CAPS, officers and airmen, and representatives from the media.

On the occasion of the first anniversary of Balakot air strikes I am glad to be amongst the fraternity of the Armed Forces. On this momentous occasion, I remember the sacrifices of the armed forces personnel in the service of the Nation and pay homage to those who have laid down their lives. I also remember the martyrs of Pulwama and wish to convey my personal gratitude to families of the CRPF security personnel who lost their fathers, husbands, brothers and sons. I would like to assure them and every citizen of India that we will remain ready and willing to respond appropriately to any threat to our national security at all times.

I am sure that this seminar will help develop a better understanding of such skirmishes and facilitate the improvement of our response options in the future.

Today the whole world stands united in the fight against terrorism and in the interest of world peace, the major nations of the world stand with India to

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Speech delivered by Hon'ble Defence Minister Shri **Rajnath Singh** at CAPS Seminar on "Air Power in No War-No Peace Scenario" on February 28, 2020 at Kothari Auditorium, DRDO Bhawan, New Delhi.

counter countries like Pakistan. We recently observed the effect of collective diplomatic and financial pressure on Pakistan. Terrorists like Hafiz Saeed who were treated as VIPs and heroes in their country are now behind bars. Yet we realise that whatever initiatives have been taken are still not enough in our fight against terrorism. Until and unless Pakistan is held accountable, it will continue with its policy of duplicity and deceit. I believe we still need to put in a lot of work in this direction.

For a long time, India has been viewed as a country that did not respond adequately against terrorism, despite grave provocations. The surgical strike of 2016 and the air strikes of 2019 at Balakot have changed this perspective for posterity. These actions were not only resolute military strikes against terrorism and terror supporting elements, they also conveyed a strong and unequivocal message that went beyond its immediate impact. These effects need to be viewed from various perspectives which I shall put in perspective today.

Let me start with our approach towards terrorism. The most significant outcome of the Balakot air strikes is the reflection of India's clear perspective in its fight against terrorism. Terrorism has been a low cost option that Pakistan has employed against India for which a suitable lesson has been conveyed to them. Through this action, we also indicated that the terrorist infrastructures and terrorist training facilities around the Line of Control and International Border are not safe havens for terrorists anymore. It was made amply clear that terrorism will not remain an option that can be proliferated anymore from across the border.

I have little doubt that the Balakot strike forced the rewriting of many a manual and rule book across the LoC. For those who preferred to place India in an imaginary understanding of the past and bracketed India's actions into predictable options, the out-of-the-box reality of our response has given them more than one reason to pause and reconsider any misadventure. These actions have been supported not only by our citizens but the world and have further strengthened our resolve against terrorism. Attempts at obfuscating reality have been rejected unequivocally. This

was a sign of changing times. Today, one year down post Balakot, I would again like to thank the countries, friends and well-wishers who supported and stood by us. Our approach to terrorism therefore was and will remain a judicious combination of clinical military action backed by mature and responsible diplomatic outreach.

The second important aspect that emerges from Balakot is our intent and capability. I remember the debate post Balakot vividly. I feel one year later, this is an opportune time to discuss the operation in all its manifestations dispassionately. Time and distance often create opportunities to reflect with greater objectivity and realism.

Balakot strikes have shown the importance and impact of military precision. Like I said, this incident has rewritten many doctrines across the LoC. It is also important to understand what it represents as a statement of intent and capability.

There are countries that spend multiple times of India's defence budget. Also, there are countries with more sophisticated and modern weapons and aircraft. There may be trained airmen and soldiers who are committed but, until and unless there is a strong will power supporting it, these efforts will never be successful. And Balakot is a successful example of how national security and critical elements can be effectively combined. I would like to congratulate the Indian Air Force on this. However, our efforts have not stopped after Balakot operation. This has been an important milestone in our quest which made our capability development more efficient and feasible. Balakot operation has taught us how to think strategically instead of tactically. It also indicates that an operational victory is won on the ground, however the war must be won against the enemy's mind.

Balakot represented the first time that Indian aerospace power was put into offensive use across the border since the war in 1971. In the last 50 years the security scenario has transformed and more so in the last two decades. Kargil and cross-border terrorism are examples of such new warfare. Hybrid warfare is today's reality and now we face a real threat from a combination of kinetic and non-kinetic tools. There is no clear-cut beginning, nor a clear

ending in this changing conflict scenario. I will touch upon three major aspects that need emphasis.

First and foremost is the point of expanding battle space. In yesteryears, wars were fought almost always along national borders within restricted geographical areas. But with the induction of long-range weapons this has been changing. Battlegrounds have expanded and it is now possible to reach any corner of a country across borders. Keeping intermediate obstacles and objectives aside, it has become possible to strike inside enemy lines. This means that the whole country is a battleground, including its communication lines for trade and supplies. Another important aspect is recognising the sources of negative power and ending them. It is not necessary that these will be present in countries with whom we have a direct conflict only. Aerospace power plays an important role in this. The attack on the Saudi Aramco Refineries in September 2019 and the killing of Qasim Suleimani by a UCAV attack is an example of this. On one hand, this fight showed the strategic importance of combat aviation. But, on the other hand, it also tells us that we have to be on the lookout against attack from all sources. We need to have a focused approach to increase battle space transparency. And aerospace power will have to play an important role in this.

The second aspect is about time compression. Today our enemies have real-time planning cycle. We have to work very fast to address any challenge that tries to stop our country's peaceful progress. And that means that forces like the Indian Air Force have to be ready for decisive blows with precision and minimal collateral in a short time.

The third aspect is about technological infusion. Generally, aviation and especially military aviation, is mostly dependent on technological changes. And as such artificial intelligence, high-speed weapons and space-based sensors and tools will be very influential. This, again, defines the role played by kinetic forces. Slowly, unmanned aircraft and systems will start combat support missions and we have to be equally ready for that.

Technology infusion has enabled state and non-state actors to launch attacks through kinetic and non-kinetic capabilities with minimal investment. This means a very high cost for creating defensive mechanisms to protect our interests and values. Here, we should use our current capabilities as well as new technologies. I believe that the role of air warriors like you will be very important here. We are proud of your bravery and courage, zeal and sacrifices you make to protect us and our country. We need to reorient our training to meet the challenges posed by hybrid warfare. As far as government support is concerned, I assure you that all resources required will be made available to our forces.

Organisationally we have initiated some major structural reforms in the way we intend tackling threats to our nation. It will take some time to operationalise the full set-up. This transition time is very important. It is also important that all stakeholders invest in making these changes effective and successful. No doubt we will face primary problems in the beginning, and we should be ready for that. It is imperative that we use our professional knowledge to find solutions to these problems.

Once again, I thank the organisers of this seminar for initiating deliberations on a very timely and appropriate theme. My best wishes for future deliberations.

Thank you.

# AIR POWER IN NO WAR- NO PEACE SCENARIO

**BIPIN RAWAT**

Hon'ble Raksha Mantri Shri Rajnath Singh, Admiral Karambir Singh Chief of the Naval Staff, Air Chief Marshal RKS Bhadauria Chief of the Air Staff, Dr. Reddy Secretary R&D and Chairman DRDO, former Chiefs, officers from the three services, ladies and gentlemen and the representatives from the media.

I am indeed privileged to address this gathering on the first anniversary of the air strikes by the IAF at Balakot. Geopolitics around the globe is changing and recent skirmishes highlight the regional significance of this aspect. Therefore, it is important to understand the nature and character of warfare. While the nature of warfare remains unchanged (and that wars will always be bloody), the character of warfare is constantly changing. It is in this context that the Centre for Air Power Studies has very aptly selected the subject on the employment of air power during sub-conventional operations in a no war no peace scenario.

It is important that the Defence services maintain credible deterrence at land, sea and air at all times to execute the role and tasks assigned based on the Defence Minister's operational directive. The capability of the three services must be synchronised towards building a formidable force. Credible

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Speech delivered by Chief of Defence Staff, General **Bipin Rawat**, PVSM, UYSM, AVSM, YSM, SM, VSM, ADC at CAPS Seminar on "Air Power in No War-No Peace Scenario" on February 28, 2020 at Kothari Auditorium, DRDO Bhawan, New Delhi.



deterrence is a result of training and constant motivation for every soldier, sailor and airman. Credible deterrence is further confirmed by ensuring the availability of right platforms, equipment, weapons and ammunition for the services to deliver the intended message to the adversary at all times.

We also need to ensure that we keep pace with changing technology, inducting modern weapon systems while upgrading the existing ones.

Credible deterrence, more importantly, comes from the will of the military leadership to deliver when called upon and the intent of political leadership to take the right decision at the right time. This has been amply displayed post Kargil, Uri and now Pulwama, when the OODA cycle (Observe, Orient, decide and act) was completed and the forces were tasked to act. It was the first time in the sub-conventional domain that Air Power was unleashed on the adversary. The message went right and clear that the proxy war perpetrated on our people will not be tolerated.

We are finding a shift in the nature of warfare and the character in which it will be executed. Amidst a dynamic scenario, we need to be prepared for a war with characteristics of 'Surprise' and 'Unpredictability' and we must ensure that the adversary remains in fear of the same. We must remain unpredictable, maintain surprise and always look at newer ways of doing things.

The message of Balakot has clearly displayed our intent to act. I use this opportunity to re-emphasise the criticality of maintaining the highest operational readiness for our forces, equipment and manpower and the need to adapt and keep pace with modern technology and times. Our operational preparedness is significant to counter and thwart attempts by the adversary to use terrorism as a weapon against our Nation.

I wish the Centre of Air Power Studies the very best for this very contemporary seminar. I am confident that the Indian Air Force will remain ever prepared to execute future operations with greater intensity. We must ensure that the OODA loop is always completed to our advantage. Thank you, ladies and gentlemen and Jai Hind.

# AIR POWER IN NO WAR- NO PEACE SCENARIO

**RKS BHADAURIA**

Hon'ble Defence Minister Shri Rajnath Singh, Chief of Defence Staff General Bipin Rawat, Chief of the Naval Staff Admiral Karambir Singh, Secretary R&D and Chairman DRDO, Dr. G Satheesh Reddy, former Chiefs, senior veterans, ladies and gentlemen, very good morning.

At the outset, I would like to thank DG CAPS for organising this seminar and selecting a very apt subject—'Air Power in No-War No-Peace Scenario', especially to commemorate the first anniversary of Balakot strike by IAF. We need to delve into the unique capabilities of Air Power and deliberate on all options of utilising Air Power in a scenario of 'No-War No-Peace'.

I must take you back one year when the government took a very tough and bold decision to strike at the very heart of the terrorist training camps, across the LoC. IAF was tasked and we achieved the task of destroying the targets with precision. This political decision and subsequent air strike changed many paradigms. First and foremost was the basic message that terrorist attacks on our soil will not be acceptable and there will be a response. All three services were ready to undertake any such operation. Target characteristic dictated the service best suited to undertake the task. The use of Air Power to strike the target, breaking the taboo that Air Power should not be used in sub-conventional warfare. This was the most important change

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Extract of Speech delivered by Air Chief Marshal **RKS Bhadauria**, PVSM AVSM VM ADC at CAPS Seminar on "Air Power in No War-No Peace Scenario" on February 28, 2020 at Kothari Auditorium, DRDO Bhawan, New Delhi.

in paradigm. The success of the mission proved the aptness of Air Power as the instrument of choice. At the politico-diplomatic level, the ability to de-escalate and get back to normal after the desired message was conveyed. De-escalation was achieved through coordination between all the concerned agencies. This was a significant development that was previously not thought to be possible in use of air power in sub-conventional scenario.

To recap the Balakot mission; on February 26, 2019, early morning, IAF successfully struck the chosen target. Pakistan Air Force responded after 30-odd hours with a huge package in a mission which they called 'Op Swift Retort'. IAF with MiG-21, Su-30 and Mirages, engaged this large package, and thwarted their attack. Thereafter, there were no further missions undertaken. The reason being that the retort itself from PAF was designed to demonstrate action taken for consumption of their domestic audience and it was fundamentally tailored to seek de-escalation. On our part, there was no reason for us to launch again, as we had achieved our objectives and the enemy did not cause any damage in his retort. In fact we surprised them with our Air Defence response. Further diplomatic activities de-escalated the situation rapidly. The mission was a demonstration of fine coordination between various agencies, calibrated use of air power and control of escalation. It is important to remember that the success of this mission showcased that Air Power and its unique capabilities can be used to great effect in such a scenario.

There were many takeaways. First and foremost, as I mentioned before, it was the demonstration of our will to strike against targets across the LoC. This credit goes to our higher leadership and is fundamental to such actions even in the future. Second, it was a highly coordinated effort. The right selection of target, our capability of acquiring imagery and intelligence and finally the ability to hit with pinpoint accuracy with standoff weapons. The Balakot Air Strike clearly demonstrated that there exists a space below the threshold of conventional war wherein Air Power can be used for targeting and yet control further escalation.

Previous norms had been against the use of Air Power in response to terrorist attacks. Though Air Power has been used across the world in such

scenarios, it was the first time that our ability to undertake such air strikes using standoff weapons was successfully exploited and demonstrated. It is important that when you undertake such missions, you have the moral high ground and in our case we did, as we were striking targets which were terrorist training camps and not any other civilian or military targets. It was important to hit the target successfully and also to ensure no collateral damage occurs. All in all it was a well-considered decision which was well executed.

There were some takeaways for us, from the air engagements that followed the day after the strike. We had a weapons edge with regard to BVR capability over Pakistan Air Force at the time of Kargil war which was subsequently lost. Thereafter, it has taken a decade and a half of struggle in acquisition processes to be able to get back a similar or a better BVR weapon capability. It did not materialise at the time of Balakot but it will materialise soon with the induction of Rafale fighters. In an air engagement, especially in deeply contested airspace, it is important to have not just a weapon's edge but also technological superiority. And for all the people in blues sitting here, once we have got back this 'edge', it is important to remember this lesson and see that in your lifetime you do not allow this 'edge' to slip away. Also, we cannot depend only on the Meteor class of BVR on Rafale, it is also important that similar capability be complemented on our other platforms.

Over the last year, IAF has procured a number of advanced weapon systems. We have inducted new sensors and expedited efforts towards some indigenous missiles. We have completed the trials of BrahMos on Su-30 and already inducted a squadron of these aircraft, as you are aware, at Thanjavur. We have been working towards enhancing our weapons, sensors, secure communications and networking capabilities. Also, there were remedial measures introduced after the fratricide of the Mi-17 helicopter during the skirmish last year.

Another area where we have made changes has been in our operational training pattern. Our focus is on integrated training and ability to rapidly move from peacetime to wartime status, to be able to conduct a mission

and handle the response. Training is also essential to optimally absorb new technology as we induct advanced weapons and sensors.

With regard to the road ahead, our acquisition plans of weapons, AWACS, AAR and sensors are progressing as planned. Here it is important that indigenous technology and weapon systems fetch up to meet the requirements in coming years. IAF and DRDO need to converge to develop weapons and technology from indigenous sources and industry. I am sure that Secy R&D and DRDO who is also here amongst us will agree that with renewed focus we can attain self-reliance in defence manufacturing. It is when our indigenous Astra Missile, which is a huge success, is inducted on Su-30, LCA and MiG-29 aircraft that enhanced performance will spread across the Indian Air Force. Indigenous technology projects should succeed in an acceptable time frame and our industry needs to step up to deliver on these products. From an IAF perspective, we will be very proud and happy to employ indigenous weapons in the next skirmish.

Over the course of this seminar, I am sure, discussions will take place on all issues of Air Power in wars affecting its use in scenarios of 'No War, No Peace'. I wish the participants of the seminar the very best. I'm sure that the eminent speakers through their discussions will reveal many areas that will immensely benefit IAF.

Jai Hind!

# COVID-19 AND PAKISTAN: EMERGING POLITICAL AND ECONOMIC CRISIS

SHALINI CHAWLA

All across the globe nations hit by COVID-19 have been severally impacted economically, socially and in some cases politically. Pakistan faces grave challenges due to the existing economic stress with low growth rate, mounting debt burden, weak healthcare facilities, economic depression, lack of coordination between the federal and provincial governments and inadequate infrastructure. The ruling party, Pakistan Tehreek-i-Insaaf (PTI), is undergoing major struggle due to intensified internal differences and decreasing popularity of the party within Pakistan. Imran Khan's government seems to have lost its credibility and there is an apparent mistrust in the government's ability to deal with the present health crisis.

Interestingly, Prime Minister Imran Khan perpetually tried to assure the nation (more than once!) that the COVID-19 problem is under control. The opposition parties—the Pakistan People's Party (PPP) and Pakistan Muslim League-Nawaz (PML-N)—have been extremely dissatisfied with Imran Khan's decisions regarding the delay in announcing the national lockdown and then relaxing the lockdown early when the numbers of coronavirus cases are still rising.<sup>1</sup> Former Defence Minister, Khawaja Asif

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1. "Pakistan Opposition accuses Imran Khan government of mishandling coronavirus crisis as the cases rise to 31, 684", PTI, India TV, May 11, 2020, <https://www.indiatvnews.com/news/world/pakistan-opposition-accuses-imran-khan-mishandling-coronavirus-616346>. Accessed on May 11, 2020.

**As the nation continues to deal with the pandemic some important developments have surfaced: increasing differences between the political parties, intensifying fissures within PTI, interesting developments in civil-military relations with the military gaining more control (directly), the military's assertion and unwillingness to compromise on defence spending.**

(PML-N), led the criticism against the government during the National Assembly session held in May (2020) after a break of two months. He said, "The current situation that we are in is due to the approximately two months-long negligence showed by the government. When we had fewer deaths, the entire country was completely shut down. Now that we are seeing a dangerous spike in cases, they are easing lockdown restrictions."<sup>2</sup> On the other hand, Imran Khan in the initial phase of the crisis (on May 15), expressed

optimism stating that Pakistan is ready to deal with the crisis, "The numbers are expected to rise and we are prepared for that. The government is working towards enhancing its health facilities and increasing capacity."<sup>3</sup>

During the initial phase of COVID-19 the ruling party leaders said that the virus is a mere flu and there is no need to panic. Imran Khan himself made a statement that the coronavirus will not be able to survive the hot weather of Pakistan. As the situation worsened and the number of cases multiplied after the opening up of the lockdown, the leadership seems to be finding new targets to blame for the spread of the pandemic. Punjab Health Minister, Yasmeen Rashid, termed the people of Pakistan as illiterate (*jahil*) for not taking precautions. The minister said, "Lahoris [citizens of Lahore] are 'weird creatures' of [*sic.*] aren't even ready to listen what we have been saying regarding the virus and social distancing. I think no nation would

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2. Ibid.

3. "Faring better than predicted Coronavirus figures: PM Imran Khan", *The Express Tribune*, May 15, 2020, <https://tribune.com.pk/story/2222190/1/>. Accessed on May 15, 2020.

have been more illiterate than us.”<sup>4</sup>

As the nation continues to deal with the pandemic some important developments have surfaced: increasing differences between the political parties, intensifying fissures within PTI, interesting developments in civil-military relations with the military gaining more control (directly), the military's assertion and unwillingness to compromise on defence spending, and very importantly, the power of the extremist clerics within Pakistan who refused to abide by the instructions of the civilian leadership regarding the lockdown and suspending large gatherings and prayer meetings. Even at the time when the nation is struggling with grave economic and political uncertainties, Pakistan has continued its relentless efforts to keep the *Kashmir* issue alive at the domestic and international front. Imran Khan and Foreign Minister Shah Mahmood Qureshi have hardly spared a public forum in the last year where they have not raised the issue of Kashmir and reminded the Pakistanis of their right to fight for Kashmir.

Externally, Pakistan is receiving generous support from China, the US (which acknowledges Pakistan's role in its negotiations with the Afghan Taliban), and Turkey (Pakistan's friend, which has been assisting in the form of various medical supplies). International financial organisations have extended support to Pakistan in the form of debt relief, loan and aid. The support brings temporary relief, but larger financial challenges remain for Pakistan.

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## THE CORONAVIRUS SPREAD

The first case of coronavirus was reported in Pakistan on February 26, 2020 in Karachi. Following this the pandemic spread in all the four provinces.

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4. "Punjab Health Minister Terms Nation 'Illiterate' for Not Taking Coronavirus Seriously", *Naya Daur*, June 16, 2020, <https://nayadaur.tv/2020/06/punjab-health-minister-terms-nation-illiterate-for-not-taking-coronavirus-seriously/>. Accessed on July 1, 2020.



The numbers in Pakistan are supposedly under-reported and there is lack of transparency and trust.<sup>5</sup> At the time of writing the article, the reports suggested that Pakistan's COVID-19 tally stood above 231,000. The number of deaths stood at 4,762. Looking into the provincial numbers, Sindh province reported 94,528 cases, Punjab 81,963, Khyber-Pakhtunkhwa 28,116, Islamabad 13,494, Balochistan 10,814, Gilgit-Baltistan 1,561 and Pakistan-Occupied Kashmir 1,342.<sup>6</sup> There has been a noticeable spread amongst the senior political leadership.

The reasons for spread of coronavirus in Pakistan have undoubtedly been the flights carrying Pakistani nationals from the severely affected countries like Spain, the United Kingdom, Italy, etc. Apart from this, the spread of coronavirus in Pakistan can be attributed to mainly three factors:

**Pilgrims from Iran:** The coronavirus started to show rapid signs of spread in Pakistan in early March when infected pilgrims and workers started pouring in from Qom, a religious city in Iran—one of the worst coronavirus affected countries. In fact, in March, Imran Khan's special assistant on public health, Dr. Zafar Mirza, blamed Iran mainly for the spread. He said, "Eighty percent of the COVID-19 confirmed patients in Pakistan originated from Iran, which lacked the capacity to deal with an international public-health emergency."<sup>7</sup>

In Iran the spread of coronavirus was fuelled by politics and religion and the pandemic did spread to many other nations, specifically the bordering nations. According to the World Health Organisation (WHO) report, 46 percent of confirmed cases in Pakistan have travelled from Iran.<sup>8</sup> The land

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5. See Dr. Rana Jawad Asghar, "COVID-19 Pakistan's magic hat of numbers", *The Express Tribune*, July 4, 2020, <https://tribune.com.pk/story/2253346/covid-19-pakistans-magic-hat-of-numbers>. Accessed on July 5, 2020.

6. Imtiaz Ahmad, "After Qureshi, now Pakistan's health minister Zafar Mirza contracts COVID-19", *Hindustan Times*, July 6, 2020, <https://www.hindustantimes.com/world-news/after-qureshi-now-pakistan-s-health-minister-zafar-mirza-contracts-covid-19/story-nFCBIUYDnpL6OowJzo7SKL.html>. Accessed on July 6, 2020.

7. "Pakistan says Iran forced 5,000 of its nationals over border despite request to wait", *Arab News*, May 12, 2020, <https://www.arabnews.com/node/1673266/world>. Accessed on May 12, 2020.

8. Owais Tohid, "Pakistani pilgrims caught in Iran's Coronavirus web", *Arab News*, April 6, 2020, <https://www.arabnews.pk/node/1654296>. Accessed on May 10, 2020.

route to Iran runs through Balochistan in Pakistan which is not equipped to handle the situation. The Baloch government spokesman, Liaquat Shiwani complained about the Iranian attitude, "We had requested Iran through the envoy in Pakistan to provide our pilgrims quarantine facilities and health certificates. ... But the Iranians were amid their own crisis and had their own cases to deal with. They started pushing the pilgrims across the border and stamping 'exit' on their passports so we had no choice. They are Pakistani citizens, we had to accept them with our limited facilities."<sup>9</sup> There are reports of ample mismanagement in Pakistan's border town of Taftan from where Pakistan received more than 6,000 pilgrims.

**Reluctance of the Clerics and Religious Extremism:** The second important factor responsible for the spread of the virus has been the reluctance of the clerics and religious preachers to close the mosques for Friday prayers. The government's biggest challenge has been countering the resistance from the clerics and Imams who remained reluctant to accept the lockdown and suspend gatherings for Friday prayers and prayers during Ramadan. The extremist clerics have refused to help and their logic has been that "To avoid mosques on Fridays would only invite God's wrath at a time when people need his mercy."<sup>10</sup>

Several Shia groups conveyed strongly that they will go ahead with the procession to commemorate the martyrdom of Hazrat Ali and that the government cannot restrict them.<sup>11</sup> The Sunni Muslim missionary group, Tablighi Jamaat (TJ) Pakistan, hosted the event in Raiwind, Lahore in mid-March. According to the reports 2,258 attendees were tested positive (by the third week of April).<sup>12</sup> The five-day annual gathering was attended by around 70,000 people (including

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9. Ibid.

10. Zia-ur-Rehman, Maria Abi-Habib and Ihsanullah Tipu Mehsud, "God will Protect Us': Coronavirus Spreads through an Already Struggling Pakistan", *The New York Times*, March 26, 2020.

11. Dipanjan Roy Chaudhary, "Pakistan bracing for 40,000-50,000 death toll due to Covid: Top doctors", *The Economic Times*, May 11, 2020.

12. Faseeh Mangi, "Now, Pakistan races to trace Lahore Tablighi event attendees to contain Covid-19", *The Print*, April 21, 2020, <https://theprint.in/world/now-pakistan-races-to-trace-lahore-tablighi-event-attendees-to-contain-covid-19/405675/>. Accessed on May 10, 2020.

more than 3,000 foreign participants).<sup>13</sup> Although the event was cut short to two days, but by then the transmission of coronavirus had hit large numbers. After the announcement of the lockdown by Imran Khan in the third week of March, the ulema and other religious groups defied government instructions and went ahead with the gatherings in mosques. It is interesting to know that at the request of Pakistan President, Arif Alvi, the Grand Imam Sheikh of Egypt, Ahmed Mohamed Ahmed al-Tayeb, the former President of Al-Azhar University, issued a Fatwa suspending the Friday prayers.<sup>14</sup>

Despite the Fatwa, there was extreme resistance to following the lockdown and suspending the prayers and the clerics continued offering collective prayers. Mufti Taqi Usmani, one of the most respected clerics, said that, "It is not possible to get rid of the Corona without asking God for forgiveness."<sup>15</sup>

The second phase of resistance came from the clerics as Ramadan drew closer. Dozens of well-known and influential clerics signed a letter demanding that the government exempt mosques from the lockdown during the month of Ramadan. The letter demanded that the prayers were essential for Muslims and should be allowed as long as safety measures were observed.<sup>16</sup> The ban on congregational gatherings did provoke a severe backlash in Pakistan and the police personnel were attacked. The leadership did try to assert its point on shutdown and restricting the gatherings to a limited number of five, but the request/orders did not go well with the clerics who hold significant clout in the country.

**Delay in Lockdown:** The third critical factor has been Imran Khan's hesitation in announcing the nation-wide lockdown after cases were being

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13. Ibid.

14. Hamza Azhar Salam and Mutaza Ali Shah, "Pakistani clerics quarrel as Egypt's Al-Azhar university announces major fatwa", GEO News, March 26, 2020, <https://www.geo.tv/latest/279347-pakistani-clerics-quarrel-as-egypts-al-azhar-university-announces-major-fatwa>. Accessed on May 10, 2020.

15. Ibid.

16. See Syed Raza Hassan, "Pakistan clerics call for lifting of congregational prayer limits", Reuters, April 14, 2020, <https://in.reuters.com/article/health-coronavirus-pakistan-mosques/pakistan-clerics-call-for-lifting-of-congregational-prayer-limits-idINKCN21X0B7>. Accessed on May 12, 2020.

reported in February-end and March beginning. The Prime Minister faced immense criticism from the opposition parties and also the Pakistani population (that section of society which was aware of the severity of the pandemic). Imran Khan's logic has been that given the state of the economy, lockdown will cause immense damage financially:

Twenty-five percent of Pakistanis are below the poverty line... today if I impose a complete lockdown then... my country's rickshaw drivers, pushcart vendors, taxi drivers, small shopkeepers, daily wage earners, all of them will be shut in their homes. If Pakistan had the resources that Italy has, that France has, that the US has, that England has, I would fully lock down all of Pakistan today.<sup>17</sup>

The Prime Minister has been deeply concerned about the economic situation but the fact remains that the spread of the virus caused due to the delay in lockdown did aggravate the situation in Pakistan.

#### **INITIATIVES BY THE GOVERNMENT TO DEAL WITH CORONAVIRUS**

Major COVID-19 relief operations/initiatives in Pakistan are based on charity in the country which many citizens feel is the best way to combat the crisis. Pakistan government announced *Ehsaas Programme* to families affected by coronavirus. Under the programme 12 million families are covered and have received (are receiving) Rs. 12,000. The daily wage earners who are the worst affected by the pandemic are the priority under this initiative.<sup>18</sup>

*Prime Minister's Relief Fund* was up on April 1 and donations have been requested to help those "who have been made destitute by the lockdown."<sup>19</sup>

*The Corona Relief Tiger Force (CRTF)*, a voluntary force, has been one of the leading initiatives by the Imran Khan government. By the end of March

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17. "Naya Pakistan Waffles on Covid lockdown—Updated", *New Pakistan*, March 27, 2020, <http://new-pakistan.com/2020/03/27/naya-pakistan-waffles-on-covid-lockdown/>. Accessed on May 1, 2020.

18. "Coronavirus: Govt to distribute funds under the Ehsaas Programme from today", *The Nation*, April 9, 2020, <https://nation.com.pk/09-Apr-2020/coronavirus-govt-to-distribute-funds-under-ehsaas-programme-from-today>. Accessed on May 11, 2020.

19. Prime Minister Imran Khan on Twitter, April 1, 2020.

**The CRTF consists of around one million volunteers including students, teachers, engineers, medical workers and social workers. The main responsibilities of the CRTF include ration distribution, implementation of the 20-point guidelines introduced by government during Ramzan, and spreading awareness regarding the pandemic.**

Imran Khan announced the formation of “Corona Relief Tiger Force” to fight the crisis. Tiger Force is an effort by the government to get the young population of the nation to unite and work towards the efforts dealing with COVID-19. Interestingly, Imran Khan urged the youth to join the Tiger Force and referred to it as *jihad* against the pandemic:

I want youth to play their role in helping our fight against the COVID-19 by joining our Corona Tiger Force, which will be organised to do Jihad against the suffering caused by this pandemic...<sup>20</sup>

The registration for Tiger Force opened on March 31 and within ten days, more than 10,000 volunteers had registered, which is indeed commendable.<sup>21</sup> The CRTF consists of around one million volunteers including students, teachers, engineers, medical workers and social workers. The main responsibilities of the CRTF include ration distribution, implementation of the 20-point guidelines introduced by government during Ramzan, and spreading awareness regarding the pandemic.<sup>22</sup>

Parallel to these initiatives, the Non-Governmental Organisations and personal initiatives aimed at collecting donations and providing essentials

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20. Aishwaria Sonavane, “Pak PM Imran Khan declares ‘Jihad’ against Covid; Asks Youth to join ‘Corona Tiger Force’”, Republicworld.com, April 2, 2020, <https://www.republicworld.com/world-news/pakistan-news/pak-pm-imran-khan-declares-jihad-against-covid-asks-youth-to-join.html>. Accessed on May 1, 2020.
  21. Aysha Imtiaz, “Pakistan’s ‘Tiger Force’ to combat coronavirus economic woes”, Al Jazeera, May 7, 2020, <https://www.aljazeera.com/news/2020/05/pakistan-tiger-force-combat-coronavirus-economic-woes-200506075821109.html>. Accessed on May 12, 2020.
  22. “Corona Relief Tiger Force”, *The Nation*, May 7, 2020, <https://nation.com.pk/03-May-2020/corona-relief-tiger-force>. Accessed on May 10, 2020.

to the masses have been actively working in different areas.

The National Core Committee (NCC) has been set up for coordination between the national and provincial governments. The NCC is the government's lead agency in the COVID-19 fight and is chaired by the Prime Minister and has representation from all the provinces, Gilgit Baltistan and the Pakistan-Occupied Kashmir. The National Disaster Management Authority (NDMA) has been tasked to acquire medical supplies and coordinate with the provincial governments for distribution.<sup>23</sup> The National Command and Operations Centre (NCOC) has been set up to closely examine the evolving situation and status of the virus spread and also devising strategy to counter the spread.<sup>24</sup>

**The ruling party won the 2018 elections and came to power promising *Naya Pakistan*, which would ensure jobs, basic essentials and housing for people. But so far nothing has been executed by the PTI government in actions, resulting in anger and frustration among the people.**

## COVID-19 IN PAKISTAN: IMPLICATIONS

### *Political Crisis*

Imran Khan's government is facing multiple challenges and there seems to be a severe political crisis in Pakistan. Imran Khan is being blamed for not handling the health crisis appropriately. Pakistan is anyway struggling with the economic challenges which the PTI government has been unable to handle. The ruling party won the 2018 elections and came to power promising *Naya Pakistan*, which would ensure jobs, basic essentials and housing for people. But so far nothing has been executed by the PTI government in actions, resulting in anger and frustration among the people. While the

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23. "Govt's timely steps to contain corona surge: Shibli", *The News*, May 12, 2020, <https://www.thenews.com.pk/print/657712-govt-s-timely-steps-to-contain-corona-surge-shibli>. Accessed on May 14, 2020.

24. Ibid.

Imran Khan government was struggling to cope with the financial issues, the coronavirus crisis hit the country, multiplying the problems. Imran Khan initially talked about the virus quite casually before realising the gravity of the problem. The government also did not abide by the World Health Organisation's (WHO) guidelines regarding the lockdown and there were reports about the lockdown being eased out to a great extent on account of Eid.

The government is being blamed for mishandling the health crisis and being indecisive. Even though it is not COVID-19 which can be held responsible for the ongoing political crisis in Pakistan, certainly the epidemic has managed to highlight the incompetence of Imran Khan's government. There are reports of rifts within the government which have allowed the domestic and international media talking about the downfall of the government. PTI suffered a major setback when the Balochistan National Party-Mengal (BNP-M) announced its decision to quit the ruling coalition led by Imran Khan. The decision of BNP-M certainly adds to the vulnerability of the current regime which has a fragile majority in the National Assembly.<sup>25</sup> The BNP-M has accused the PTI of not keeping to its promises and not paying adequate attention to the Baloch sufferings. The two parties reportedly signed a six-point memorandum of understanding in August 2018 for an alliance at the centre. The MoU included: "recovery of missing persons, implementation of the National Action Plan (NAP), observance of six per cent quota for Balochistan in federal government departments, immediate repatriation of Afghan refugees and construction of dams in the province to resolve the acute water crisis."<sup>26</sup>

The PTI government has been seemingly too absorbed with the Kashmir issue and has not paid attention to Balochistan which has infuriated the Baloch. The BNP chief, Mr. Megal's anger and frustration are reflected in his statement, "You [the government] are constituting committees on Kashmir

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25. Amir Wasim, "Setback for PTI as BNP-M quits ruling alliance", *Dawn*, June 18, 2020, <https://www.dawn.com/news/1564271>. Accessed on July 1, 2020.

26. *Ibid.*

which is not with us, but you are not worried about losing what you already have,... This house can discuss issues of wheat, sugar and tomatoes, but not the blood of the Baloch people."<sup>27</sup>

In a significant development the federal Minister for Science and Technology, Fawad Chaudhary, gave an interview to Voice of America (VOA), which brought out the faultlines in the ruling party and the grievances of the party members.<sup>28</sup> He highlighted in his interview the rifts among the senior party leaders which have allowed non-elected members to join the cabinet. He said that the non-elected members have replaced the elected representatives in the close circle of Imran Khan. There is immense frustration within the government as the special assistants and advisors to the PM occupy the key ministerial positions and the elected members are being sidelined.<sup>29</sup> There have been various reports of in-house fighting and blame game and this intra-party bickering has impacted PTI's public image.

### *Army's Nation*

The COVID-19 crisis has once again demonstrated that the military calls the shots and dominates critical decision-making in Pakistan. On March 22, Imran Khan, in his address, expressed his unwillingness and lack of conviction regarding the national lockdown. However, in less than twenty-four hours, Pakistan Army spokesperson, Major General Iftikhar, announced the lockdown contradicting Imran Khan's stance. After the announcement of the lockdown the army has been deployed all over the country to oversee the COVID-19 response efforts through the National Core Committee.<sup>30</sup> Interestingly, Commander of the Air Defence Command, Lt Gen Hamood

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27. Ibid.

28. Fawad Chaudhry's interview with Voice of America (VOA), June 22, 2020, [https://www.youtube.com/watch?v=70X39IQ\\_k88](https://www.youtube.com/watch?v=70X39IQ_k88). Accessed on July 8, 2020.

29. Fahd Husain, "RED ZONE FILES: PTI's festering fault lines", *Dawn*, June 25, 2020, <https://www.dawn.com/news/1565070/red-zone-files-ptis-festering-fault-lines>. Accessed on July 1, 2020.

30. "Imran Khan's government authorizes army to take over in case of lockdown violations", *WION*, April 26, 2020, <https://www.wionews.com/pakistan/imran-khans-government-authorises-army-to-take-over-in-case-of-lockdown-violations-294830>. Accessed on May 12, 2020.



Uz Zaman Khan, has been appointed as the convener of the NCOC. The NCOC is acting as an implantation arm of the NCC.<sup>31</sup> The Imran Khan government has authorised the Pakistan army to oversee adherence to the lockdown.

Once again it was established that in Pakistan 'crisis' cannot be managed without the military stepping in. One of the retired Generals made an important statement which explains the situation aptly. He said, "The government left a big gap in its handling of the Coronavirus. The army has tried to fill that gap, there was no choice."<sup>32</sup>

In another significant move, former Inter-Services Public Relations (ISPR) chief, Lt Gen Asim Saleem Bajwa (Retd), has been appointed as the new Special Assistant to the Prime Minister on information and broadcasting. Bajwa is also leading the China-Pakistan Corridor Authority. He replaced Firdous Ashiq Awam, with whom Imran and the army were unhappy over corruption allegations.

PTI's inability to handle the domestic situation has allowed the military to take control of multiple key positions. Another significant example of military taking over the important and lucrative positions is the appointment of the Air Marshal (Retd) Arshad Malik as the head of the state-owned Pakistan International Airlines (PIA). The PIA has come under major scrutiny after self-destructive revelations by Aviation Minister, Ghulam Sarwar Khan. The minister said in the national assembly that almost 40 percent of Pakistani pilots have fake licences. This has had major repercussions for the PIA and many countries have decided to suspend PIA operations to their countries. This issue is serious for Pakistan and could have a long-term severe impact on the Pakistan aviation sector and Pakistani aviation professionals around the world.

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31. "Pakistan Army to oversee coordination between federal, provincial govts, cases cross 2,200", *The Economic Times*, April 2, 2020, <https://economictimes.indiatimes.com/news/defence/pakistan-army-to-oversee-coordination-between-federal-provincial-govts-cases-cross-2200/articleshow/74948030.cms?from=mdr>. Accessed on May 10, 2020.

32. "As Coronavirus crisis ravages Pakistan, military trumps Imran Khan", *The Times of India*, April 26, 2020, <https://timesofindia.indiatimes.com/world/pakistan/as-coronavirus-crisis-ravages-pakistan-military-trumps-imran-khan/articleshow/75385589.cms>. Accessed on May 13, 2020.

### *Economic Stress*

The Pakistan economy has been under major stress for the last few years and Prime Minister Imran Khan, despite his 2018 election promise of '*Naya Pakistan*', has not been able to deliver results on stabilising the financial front. Debt burden is rising, inflation is high and unemployment is adding massive frustration amongst the masses. Pakistan's GDP growth rate stood at 3.3 percent in 2019. After multiple rounds of negotiations Pakistan did manage to get an approval of US\$ 6 billion loan from the International Monetary Fund (IMF) with tough conditionalities in 2019. Pakistan has also been under severe pressure from the Financial Action Task Force (FATF) to contain and act against terror financing. The country has been on the FATF grey list and getting repeated warnings to act in order to avoid the FATF black list. Pakistan now has a breather and the FATF meeting, originally scheduled in June to assess Pakistan's case, has been postponed due to the COVID-19 crisis.

Pakistan's near-term macroeconomic outlook has severely deteriorated following the COVID-19 outbreak and the *International Monetary Fund World Economic Outlook* has projected the GDP growth rate at -1.5 percent in 2020.<sup>33</sup>

The adverse impact of COVID -19 has been highlighted in Pakistan's federal budget 2020-2021:

- "The Industry and the retail businesses all over Pakistan have been badly affected
- Economic growth has been reduced by Rs. 3 trillion which brought down GDP growth projection from 3.3% to -0.4%
- Projection of overall budget deficit has been revised upward from 7.1% to 9.1% of GDP
- FBR revenue loss has been projected at Rs. 900 billion
- Non-tax revenue of the federal government has been reduced by Rs. 102 billion
- Exports and remittances have been badly affected

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33. International Monetary Fund, *World Economic Outlook, April 2020: The Great Lockdown*, <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>. Accessed on May 15, 2020.

**Beijing has actively supported Pakistan and has supplied masks, testing kits, ventilators and protective clothes, and most importantly, medical staff to assist Pakistan's inadequate healthcare infrastructure. Turkey has been supporting Pakistan and sending assistance in the form of medical equipment.**

- Unemployment and poverty have increased
- Large-scale manufacturing and FDI have declined
- Domestic tourism in Pakistan has stalled.<sup>34</sup>

Pakistan did request the IMF for a low-cost, fast disbursing loan under the fund's Rapid Financing Instrument (RFI) in order to deal with the coronavirus crisis.<sup>35</sup> The IMF has approved US\$ 1.4 billion of rapid financing for Pakistan to facilitate Pakistan's urgent balance of payment requirements and assist it in dealing with the socio-economic impact of the crisis.<sup>36</sup>

The government has been working aggressively towards raising finances and appealing for debt relief. Imran Khan has appealed for a 'Global Initiative for Debt Relief'. According to the Prime Minister, the initiative on Debt Relief intends to "bring together stakeholders on a platform to promote coordinated health and economic response."<sup>37</sup> Pakistan's Foreign Minister, Shah Mahmood Qureshi, sought China's support at the G-20 forum for the initiative. Pakistan's efforts in this direction have yielded results and Pakistan will reportedly sign a US\$ 2 billion debt relief agreement with G-20 before December 31, 2020.<sup>38</sup> In addition to the IMF loan Pakistan has received US\$ 200 million from the World

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34. Federal Budget 2020-2021, Budget in Brief, Government of Pakistan, Finance Division Islamabad, June 12, 2020. [http://www.finance.gov.pk/budget/Budget\\_in\\_Brief\\_2020\\_21\\_English.pdf](http://www.finance.gov.pk/budget/Budget_in_Brief_2020_21_English.pdf). Accessed on July 14, 2020.

35. "IMF to consider \$1.4 bn loan to Pakistan to help tackle economic impact of Covid-19", *The Print*, April 13, 2020, the print.in. Accessed on May 13, 2020.

36. "IMF to tide Pakistan over COVID-19 shocks", *The News*, May 15, 2020, <https://www.thenews.com.pk/print/658736-imf-to-tide-pakistan-over-covid-19-shocks>. Accessed on May 16, 2020.

37. "Imran Khan urges world community to grant debt relief as Pakistan's coronavirus cases reach 5,230", *The Hindu*, April 13, 2020.

38. "Pakistan to avail Rs. 335 billion debt relief from G-20 to mitigate negative effects of Pandemic", *The Economic Times*, July 6, 2020, <https://economictimes.indiatimes.com/news/international/world-news/pakistan-to-avail-rs-335-billion-debt-relief-from-g20-to-mitigate-negative-effects-of-pandemic/articleshow/76810482.cms>. Accessed on July 7, 2020.

Bank and US\$ 305 million emergency COVID-19 loan from the Asian Development Bank (ADB).

Islamabad has been receiving lavish assistance from its all-weather friend, China. Beijing has actively supported Pakistan and has supplied masks, testing kits, ventilators and protective clothes, and most importantly, medical staff to assist Pakistan's inadequate healthcare infrastructure. Turkey has been supporting Pakistan and sending assistance in the form of medical equipment.

Pakistan did manage to amend its relations with the United States (to some extent) by acting as an active facilitator in the US-Taliban agreement signed in February 2020, facilitating the exit of the foreign forces from Afghanistan. The Pakistani leadership has been cherishing the change in the US position towards Pakistan. Washington has recently announced a welcome relief package for Pakistan. According to US chargé d'affaires Paul W. Jones, "This is the latest chapter in a long, vibrant US-Pakistan health partnership," in regard to the emergency coronavirus assistance. Talking about the US commitment towards Pakistan he said, "Since designating Pakistan a priority country for coronavirus assistance, the United States has committed nearly US\$ 15 million in new coronavirus response funding to our joint efforts. All of these contributions were identified as top priority needs by Pakistani authorities and are fully paid by the American people."<sup>39</sup>

Even though Pakistan has been running from pillar to post for financial relief and assistance, the interesting part is that the country's commitment for defence spending has not changed. Military expenditure remains a leading priority for the Pakistan leadership. Pakistan is compelled to allocate 41 percent of national expenditure to debt servicing and the tax revenue has projected a downfall owing to the ongoing economic challenges and

**Pakistan allocated Rs. 1.29 trillion for defence in the budget for the fiscal year 2020-2021. This represents an increase of close to 12 percent as compared to last year.**

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39. "US helps Pakistan in its COVID-19 battle", *The Express Tribune*, May 15, 2020, <https://tribune.com.pk/story/2221936/1-us-helps-pakistan-covid-19-battle/>. Accessed on May 15, 2020.

COVID-19. Despite these stresses, Pakistan allocated Rs. 1.29 trillion for defence in the budget for the fiscal year 2020-2021. This represents an increase of close to 12 percent as compared to last year.

## CONCLUSIONS

Various reports from health experts suggest that the pandemic COVID-19 is here to stay (for a few more months or potentially for another year!) and the world will have to learn to *live with it and deal with it*. The outbreak of COVID-19 has certainly intensified Pakistan's economic woes. Imran Khan is facing challenges from four fronts—a looming political crisis with clear rifts appearing within the government; COVID-19 crisis which is not going away anytime soon; multiplying economic challenges; and declining popularity and fan following of Imran, who in 2018, was seen as a leader genuinely committed to upliftment and well-being of Pakistan. In the last six months there have been significant developments and some critical deductions can be made:

- Pakistan military retains the power strings, and although there have been some signs of stiffness in the civil-military relations, Imran Khan and the military are very much in sync with each other. Imran Khan is likely to stay in power for some time as the military does not seem to have a suitable alternative. The civil-military relations remain cautiously comfortable. The existing perception that Pakistan's civilian leadership is incapable of managing a crisis without military support has been strengthened.
- The military does not intend to take any cuts in the defence budget owing to COVID-19. The military has sought additional outlay of Rs. 63.69 billion to cover a 20 percent increase in the salaries of the armed forces personnel.<sup>40</sup> The defence budget has been increased by 12 percent and the *actual defence spending* is likely to be maintained at a high level.

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40. Imtiaz Ahmed, "Pakistan military seeks nearly Rs. 64 bn for salary hike of personnel", *Hindustan Times*, May 12, 2020, <https://www.hindustantimes.com/india-news/pakistan-military-seeks-nearly-rs-64-bn-for-salary-hike-of-personnel/story-2RZnWZukhkvWPQs7ifhBXX.html>. Accessed on May 14, 2020.

- The COVID-19 crisis demonstrated the strength of the extremist religious preachers. The lockdown orders by the government were clearly defied by the mosques, and a large number of cases can be attributed to this factor.
- Pakistan's economy will take a serious blow due to COVID-19 and the IMF projections indicate a negative growth rate for 2020. Pakistan has been diplomatically very active in raising funds and debt relief. These initiatives are likely to provide short-term relief to Pakistan's economy.
- Sino-Pakistan alliance will continue to grow and Beijing will provide extended support to Pakistan at bilateral level and multilateral forums. Some projects of the China-Pakistan Economic Corridor (CPEC) will see delays but this is unlikely to hamper the momentum of the alliance.
- Support from the US is significant for Pakistan not only in terms of quantum of aid, equipment, etc., but also the diplomatic support at the international forums.
- India-Pakistan tensions continue to grow and New Delhi's decision to reduce the strength of the Pakistan High Commission in New Delhi by nearly 50 percent is a strong message to Pakistan that its continued acts of terror and disgraceful comments leave little scope for diplomatic relations.

The critical question is, will the COVID-19 crisis affect Pakistan's actions and objectives against India? The answer is clearly 'No'. Terror attacks in Jammu and Kashmir have clearly indicated that Pakistan intends to continue and accelerate the sub-conventional war under a different brand—*The Resistance Front (RTF)*—in Kashmir. Pakistan has also continued to raise the Kashmir issue at various international forums. New Delhi is unlikely to see a change in Pakistan's strategy which primarily relies on covert war and projection of a low nuclear threshold.

# MISSILE CAPABILITY OF PAKISTAN 2010–2020

NASIMA KHATOON

## INTRODUCTION

In the past decade Pakistan's nuclear weapons and missile programme has expanded rapidly. The development and addition of new missiles in Pakistan's nuclear inventory during this time outnumbered the nuclear missiles developed in either of the previous two decades since Pakistan's first missile test in 1989.<sup>1</sup> These advances merit a study of the country's missile developments during this period.

Pakistan's research on rocketry began in the early 1960s at the Space Science Research Wing of the Pakistan Atomic Energy Commission (PAEC). Later, the research wing was established as a separate entity, Space and Upper Atmosphere Research Commission (SUPARCO). Pakistan's venture into ballistic missiles development began in SUPARCO and subsequently, the organisation emerged as the centre of its solid-fuel ballistic missile development programme.

National Engineering and Scientific Commission (NESCOM) is the primary military research organisation responsible for carrying out research

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1. Pakistan's nuclear inventory presently contains nine types of ballistic missiles and five types of cruise missiles. Among these, four types of ballistic missiles and three types of cruise missiles have been introduced and developed from 2010 to 2020. Out of fourteen missile types, seven new variants of missiles have been introduced in this time period.

**Army Strategic Forces Command (ASFC) administers Pakistan Army's nuclear command and control mechanism. ASFC is responsible for training, deployment and activation of nuclear missiles.**

for Pakistan's nuclear and ballistic missile development and production. NESCOM administers several defence development programmes, including National Defence Complex (NDC) and Air Weapon Complex (AWC). NDC is the single most important organisation for Pakistan's missile development programmes and credited with redesigning several ballistic missiles, originally developed by SUPARCO and PAEC. NDC also developed and conducted flight tests of Pakistan's first

Ground Launched Cruise Missile Babur (Hatf-7).

Army Strategic Forces Command (ASFC) administers Pakistan Army's nuclear command and control mechanism. ASFC is responsible for training, deployment and activation of nuclear missiles. In February 2000, Pakistan instituted an elaborate command and control mechanism comprised of National Command Authority (NCA), Strategic Plan Division (SPD) and Strategic Forces Command. In 2006, the Pakistani government set up separate commands for all three services. The National Command Authority (NCA) is the highest decision-making body; the Strategic Plan Division (SPD) is in charge of developing and managing Pakistan's nuclear capability; and the Strategic Forces Command (SFC) is responsible for planning and control as well as operational directives for deployment of nuclear weapons.<sup>2</sup> Inter-Services Public Relations (ISPR) is the media wing of Pakistani military and operates as a unified public relations system for Pakistan Armed Forces.

In February 1989, Pakistan first tested two of its Hatf series of ballistic missiles—Hatf-I and Hatf-II (Abdali).<sup>3</sup> However, from the commencement of Pakistan's missile development programme, it is reported that foreign

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2. Army Strategic Forces Command (ASFC), *Globalsecurity.org*, <https://www.globalsecurity.org/wmd/world/pakistan/asfc.htm>. Accessed on May 21, 2020.
  3. "Pakistan Derives its First 'Hatf' Missiles from Foreign Space Rockets", *Wisconsin Project on Nuclear Arms Control*, October 1, 1995, <https://www.wisconsinproject.org/pakistan-derives-its-first-hatf-missiles-from-foreign-space-rockets/>. Accessed on May 20, 2020.



assistance primarily from China and North Korea has been forthcoming. This foreign assistance has mainly been in the form of transfers of missile technology, launchers and other related materials. Significant design similarities between various Chinese and Pakistani missiles have been observed by analysts studying missile proliferation.<sup>4</sup>

In the past decade, Pakistan's missile development programme has seen advances in building new missile technologies. The most significant technological developments include the deployment of Tactical Nuclear Weapon, development of the Multiple Independently Targetable Re-entry Vehicle (MIRV) technology, enhanced strategic standoff capability and development of Submarine Launched Cruise Missiles in order to complete the nuclear triad. While Pakistan is yet to completely develop and operationalise most of these technologies, the rapid pace of development has grown substantially in recent years through missile tests and suspected foreign assistance by China. With four operational plutonium production reactors, uranium enrichment facilities and frequent tests of nuclear capable missiles, Pakistan's nuclear and missile programme is on its way to building Full Spectrum Deterrence capability<sup>5</sup> and nuclear triad. According to a 2019 report on global nuclear warhead inventories by Stockholm International Peace Research Institute (SIPRI), presently the country has an estimated 150 to 160 warheads which include sophisticated miniaturised warheads. The

**With four operational plutonium production reactors, uranium enrichment facilities and frequent tests of nuclear capable missiles, Pakistan's nuclear and missile programme is on its way to building Full Spectrum Deterrence capability and nuclear triad.**

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4. For more information on China-Pakistan nuclear proliferation network refer to Gordon Corera, *Shopping for Bombs: Nuclear Proliferation, Global Insecurity, and the Rise and Fall of the A.Q. Khan Network* (New York: Oxford University Press, 2009); Hassan Abbas, *Pakistan's Nuclear Bomb—A Story of Defiance, Deterrence, and Deviance* (Penguin-Allen Lane, 2018); Adrian Levy, *Deception: Pakistan, the United States, and the Secret Trade in Nuclear Weapons* (Walker Books, 2007).
  5. ISPR press release no. PR-615/ 2017, December 21, 2017, <https://www.ispr.gov.pk/press-release-detail.php?id=4459>. Accessed on February 20, 2020.

number of warheads is more than India's estimated nuclear stockpile of 130-140 warheads, in the same year.<sup>6</sup>

### **SCOPE AND SOURCE**

The scope of this paper is to highlight Pakistan's nuclear missile capabilities and the advancement of its nuclear missile programme from 2010 to 2020. During this period, several missile tests were carried out to reportedly improve guidance, propulsion and control features, along with enhanced range, accuracy and reduced circular error probabilities (CEP). Against this background, the paper also traces the development of new missile technologies, addition of new missiles in Pakistan's nuclear inventory, and also maps all the missile tests that have been conducted in those ten years.

The paper makes use of press releases issued by Pakistan's military media wing, the Inter-Services Public Relations (ISPR) Directorate to get the claimed technical parameters of Pakistan's missiles and improvements in their operational effectiveness. ISPR claims are then compared with additional information from transcripts of interviews of retired scientists from various sources and research reports of other think tanks. The assessment is based completely on information in the public domain. The paper begins by identifying the Ballistic and Cruise missiles as provided in Table 1.

### **BALLISTIC AND CRUISE MISSILES OF PAKISTAN**

Presently, Pakistan has six types of nuclear capable ballistic missiles with three of them under development, i.e., Shaheen-III, Shaheen-1A and Ababeel. Based on a classification of their launch platforms, it has three types of cruise missiles—the Babur series of Ground/Submarine Launched Cruise Missiles (GLCM/SLCM) and the Air Launched Cruise missiles (ALCM) Ra'ad and Ra'ad-II. Of these the Babur-3 SLCM, Babur-2/1(B) GLCM and Ra'ad-2 ALCM are undergoing development. Apart from these, it is speculated that an ICBM—Taimur, with a range of 7,000 km—is under development by Pakistan.

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6. Shannon N. Kile and Hans M. Kristensen, "Pakistani nuclear forces", *World Nuclear Forces, SIPRI Yearbook 2019*, accessed on December 4, 2019.

Table 1 summarises Pakistan’s missiles with specific details. The missiles are listed on the basis of their range, from the longest to the shortest range.

**Table 1: Pakistan’s Ballistic and Cruise Missiles**

Missile Name	Range	Type of the Missile	First Test	Remarks
<b>Ballistic Missiles</b>				
Shaheen-III	2,750 km	Surface to surface, two-stage, solid-fuel ballistic missile	March 9, 2015	Longest range missile in Pakistan’s strategic arsenal. It is a road-mobile missile and reportedly mounted on a Chinese TEL. The missile is claimed to bring all parts of India under the range of Pakistan’s missile.
Ababeel	2,200 km	Surface-to-surface, three-stage, solid-fuel ballistic missile	January 24, 2017	Reportedly capable of carrying MIRVs. Basic design shares resemblances with China’s CSS-7/DF-11 missile.
Shaheen-II/ Hatf-6	1,500 km to 2,000 km	Road-mobile, solid-fuel, surface-to-surface ballistic missile	First displayed in March 2000 and first tested in March 2004	It is believed that the missile is based on PRC’s M-18/DF 11. It is a two-stage version of Shaheen-I missile. The missile is in service since 2014.
Ghauri / Hatf-V	1,250-1,500 km	Road-mobile, liquid-fuelled, single-stage ballistic missile	First tested in 1998  In service since 2003	The only liquid-fuelled ballistic missile system of Pakistan. Launched from modified Russian ‘Scud-B’ Transporter-Erector-Launcher (TEL) vehicles. Nearly identical in appearance to North Korea’s No Dong 1 missile.

Shaheen-1A (Hatf-IV)	900 km	Solid-fuel, road-mobile ballistic missile	April 25, 2012	Shaheen-1A is the extended-range version of Shaheen-1. It is presently under development. The missile's impact point was in the Arabian Sea. The missile is claimed to have advanced guidance system which makes it highly accurate.
Shaheen-1/ Hatf-IV	650 km	Solid-fuel, single-stage ballistic missile	April 1999	Flight tests may have begun as early as July 1997. Entered service with the Pakistani Army in 2003. It appears to be a scaled-up version of the Chinese DF-11 missile which Pakistan imported and possibly reverse engineered to develop Shaheen-1. In April 2013, the range of the missile was claimed to be 900 km.
Ghaznavi/ Hatf-III	290 km	Road-mobile, solid-fuel, single-stage ballistic missile	First tested in May 2002	The missile appears to be similar to a Chinese DF-11 variant. Entered service with the Pakistani Army in 2004. Flight tested six times in the last ten years.

Abdali/ Hatf-II	180 km	Road-mobile, single-stage, solid-fuel surface-to- surface ballistic missile	May 28, 2002 and entered service in 2005	ISPR claims that the missile system with its varied manoeuvrability options provides an “operational level capability” to Pakistan’s Strategic Forces in addition to the strategic and tactical level capability, which Pakistan already possesses. Use of solid propellant decreases the preparation time and the TEL offers the advantage of effective mobility.
Hatf-IX/ Nasr	60-70 km	Surface-to- surface, solid- fuel, Tactical Nuclear Weapon (TNW)	April 19, 2011	The system is a quick reaction “shoot-and-scoot” missile. It appears that the missile is intended for battlefield use only. Tested eight times in the past decade. The missile is believed to be deployed in 2013.

<b>Cruise Missiles</b>				
(Three types of cruise missiles with land, air and sea launch capabilities)				
<b>Missile Name</b>	<b>Range</b>	<b>Type of the Missile</b>	<b>First test</b>	<b>Remarks</b>
Babur/ Hatf-VII	600-700 km	Turbojet powered, solid-fuel, terrain hugging, subsonic, Ground Launch Cruise Missile (GLCM)	August 12, 2005	It is designed to fly at low altitude to avoid radar detection. The storage facility of Babur at the Arabian Seaport of Ormara in Baluchistan province has recently been expanded massively. Both Babur and Ra'ad missiles are much slimmer than Pakistan's ballistic missiles, suggesting some success with warhead miniaturisation based on plutonium.
Babur- 2/1(B)	700 km	Ground Launched Cruise Missile (GLCM)	December 14, 2016	An extended range version of Babur/Hatf-7. Babur Weapon System-2/1(B) is claimed to have incorporated advanced aerodynamics and avionics that can strike targets both at land and sea.

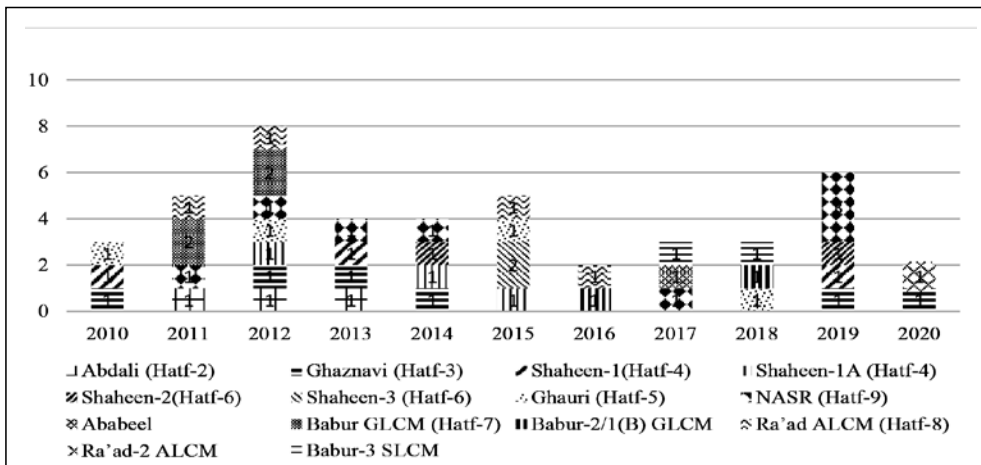
Babur-3	450 km	Submarine-Launched Cruise Missile (SLCM)	January 9, 2017	Babur-3 is a sea-based variant of Ground Launched Cruise Missile (GLCM) Babur-2. It has been test-launched twice from “an underwater, mobile platform” and “an underwater dynamic platform” from an undisclosed location in the Indian Ocean. The ISPR press statement says “the missile will provide Pakistan with a Credible Second-Strike Capability, augmenting deterrence.” Once operational the Babur-3 will provide Pakistan with nuclear triad capability.
Ra’ad/Hatf-8	350 km	Turbojet-powered, subsonic Air-Launched Cruise Missile (ALCM)	Test began in August 2007	Babur and Ra’ad are both much slimmer than Pakistan’s ballistic missiles, suggesting some success with warhead miniaturisation based on plutonium instead of uranium.
Ra’ad-2	600 km	Nuclear capable Air-Launched Cruise Missile (ALCM)	February 18, 2020	Extended-range version of Ra’ad missile. The test is claimed to have enhanced the air delivered strategic standoff capability of the military on land and at sea.

### TRENDS IN TESTING: 2010 TO 2020

Having documented the various kinds of ballistic and cruise missiles in the above section, the paper examines the trends evident through missile

tests. Fig. 1 presents a graphical representation of these tests over the years. The data is organised in chronological order, from 2010 to 2020. An examination of the figure reveals that in the last decade Pakistan has added seven new missile types to the already existing missile inventory. These additions include Nasr missile in 2011, Shaheen-1A in 2012, Shaheen-3 in 2015, Babur-2 cruise missile in 2016, Ababeel and Babur-3 missiles in 2017 and Ra’ad-2 missile in 2020. Missiles which were tested frequently are Nasr (eight times), Ghaznavi (six times), Abdali (three times), Shaheen-1A (three times), Ghauri (four times), Babur and Babur-2 (six times) and Ra’ad and Ra’ad-2 (four times).

**Figure 1: Pakistan’s Nuclear Missile Tests: 2010–2020**



It can be observed that missiles of all ranges were tested multiple times, ranging from the relatively short-range missiles, i.e., Nasr (70 km), Abdali (180 km), Ghaznavi (290 km) along with the relatively long-range missiles, i.e., Ghauri (1,300 km), Shaheen-1A (900 km), Shaheen-III (2,750 km) and Ababeel (2,200 km). In the case of ballistic missiles, Pakistan has primarily emphasised the development of road-mobile, solid-fuel, relatively short-range missile systems. The number of tests for the short-range systems were more than the long-range systems. Similarly, with the



introduction of three new missile types, the last five years have marked significant progress in building cruise missile capability. The three cruise missile systems—the Babur, Ra’ad, and the naval variant of the Babur—are also suitable for short-range targeting. Overall, from 2010 to 2019, 43 missile tests have been conducted with almost five tests in a year on an average. Each of these tests was claimed to be successful by ISPR, whereas no official information on failed missile tests is available in the public domain.

These trends indicate two main objectives of Pakistan’s nuclear development programme. Frequent testing of short-range missiles indicates a possible shift towards light-weight and more compact plutonium-based warheads to counter India’s conventional superiority by use of low-yield nuclear weapons at the tactical level, thereby escalating the conflict to nuclear level. Second, the main objective towards developing relatively longer-range missiles with sophisticated technologies like multiple warhead technology is obviously to achieve Full Spectrum Deterrence capability.

**Table 2: Pakistan’s Nuclear Missile Tests: 2010–2020**

Year	Missile Name	Range	Type of Missile	Remarks
May 8, 2010	Ghaznavi (Hatf-III)	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile	The test was conducted at the conclusion of the annual field training exercises of Army Strategic Forces Command, which were aimed at testing the operational readiness of Strategic Missile Groups.

May 8, 2010	Shaheen-I (Hatf-IV)	650 km	Solid-fuel, single-stage ballistic missile	The launch was conducted at the training exercise of Army Strategic Forces Command* to test the readiness of Strategic Missile Groups equipped with Ghaznavi and Shaheen missile systems.
December 21, 2010	Ghauri (Hatf-V)	1,300 km	Road-mobile, Liquid-fuelled, single-stage ballistic missile	The test was a training launch aimed at testing the operational readiness of the Army Strategic Force.
February 10, 2011	Babur (Haft VII)	600 km	Turbojet-powered, solid-fuel, terrain hugging, subsonic, Ground Launch Cruise Missile (GLCM)	The missile has stealth capabilities, is a low flying, terrain hugging missile with high manoeuvrability, radar avoidance capability and pinpoint accuracy. It also incorporates the TERCOM and DSMAC technologies. No mention of use of MLV.

<p>March 11, 2011</p>	<p>Abdali (Hatf-II)</p>	<p>180 km</p>	<p>Road-mobile, single-stage solid propellant surface-to-surface ballistic missile</p>	<p>It was stated that the Abdali weapons system provides Pakistan with an operational level capability, additional to the strategic level capability, which Pakistan already possesses because of its medium-range and long-range ballistic missile systems.</p>
<p>April 19, 2011</p>	<p>Nasr (Hatf-IX)</p>	<p>70 km</p>	<p>Surface-to-surface, solid-fuel, Tactical Nuclear Weapon (TNW)</p>	<p>First flight test of the newly developed surface-to-surface ballistic Missile Hatf-IX (Nasr). The missile has been developed to add deterrence value to Pakistan's Strategic Weapons Development programme at shorter ranges. The Nasr Weapon System now provides Pakistan with short-range missile capability in addition to the already available medium and long-range ballistic missiles and cruise missiles in its inventory.</p>

April 29, 2011	Ra'ad (Hatf-8)	350 km	Turbojet-powered, subsonic Air Launched Cruise Missile (ALCM)	The missile test was conducted as part of the continuous process of improving the technical parameters of the weapon system. Press release is same as 2012 test.
October 28, 2011	Babur (Hatf-VII)	700 km	Turbojet-powered, solid-fuel, terrain hugging, subsonic, Ground Launch Cruise Missile (GLCM)	The range has increased by 100 km from the last test in February 2011 (the declared range was 600 km). The test was conducted to validate design parameters of the weapon system and a new missile launch vehicle (MLV). The three-tube MLV enhances the targeting and deployment options in the conventional and nuclear modes. With its shoot-and-scoot capability, the MLV provides a major force multiplier effect for target employment and survivability.

March 5, 2012	Abdali (Hatf-II)	180 km	Road mobile, single-stage solid propellant surface-to-surface ballistic missile	It provides an operational level capability to Pakistan's Strategic Forces in addition to the strategic and tactical level capability, which Pakistan already possesses.
April 25, 2012	Shaheen-1A (Hatf-IV)	Not mentioned	Solid-fuel, road-mobile ballistic missile	First test of the missile. The missile is an improved version of Shaheen-1 with improvements in range and technical parameters. No mention of the range.
May 10, 2012	Ghaznavi (Hatf-III)	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile	The missile appears to be similar to a Chinese DF-11 variants. Entered service with the Pakistani Army in 2004.
May 29, 2012	Nasr (Hatf-IX)	70 km	Surface-to-surface, solid-fuel, Tactical Nuclear Missile (TNW)	The Director General Strategic Plans Division stated that it will consolidate Pakistan's deterrence capability at all levels of the threat spectrum.

<p>May 31, 2012</p>	<p>Ra'ad (Hatf-8)</p>	<p>350 km</p>	<p>Turbojet-powered, subsonic Air Launched Cruise Missile (ALCM)</p>	<p>Enables Pakistan to achieve strategic standoff capability on land and at Sea. Ra'ad Cruise Missile with Stealth Capabilities is a Low Altitude, Terrain Hugging Missile with high manoeuvrability, can deliver nuclear and conventional warheads with pinpoint accuracy. According to the claim by ISPR, it employed fully automated Strategic Command and Control Support System (SCCSS) which enabled robust Command and Control capability of all strategic assets with round the clock situational awareness in a digitised network centric environment to decision makers at National Command Centre (NCC).</p>
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June 5, 2012	Babur (Hatf-VII)	700 km	Turbojet- powered, solid- fuel, terrain hugging, subsonic, Ground Launch Cruise Missile (GLCM)	It is a low flying, terrain hugging missile, which can strike targets both at Land and Sea with precision and high manoeuvrability. It carries stealth features. Equipped with modern cruise missile technology of Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Correlation (DSMAC). The missile was launched from missile launch vehicle (MLV), which enhances the targeting and deployment options of Babur Weapon system.
September 17, 2012	Babur (Hatf-VII)	700 km	Turbojet- powered, solid- fuel, terrain hugging, subsonic, Ground Launch Cruise Missile (GLCM)	Missile specifications same as June 2012 test.

November 28, 2012	Ghauri (Hatf-V)	1,300 km	Road-mobile, Liquid-fuelled, single-stage ballistic missile	The test monitoring of the launch was conducted at the National Command Centre through the medium of National Command Authority's fully automated Strategic Command and Control Support System (SCCSS).
February 15, 2013	Abdali (Hatf-II)	180 km	Road-mobile, single-stage solid propellant surface-to-surface ballistic missile	The weapon system with its varied manoeuvrability options provides an operational level capability to Pakistan's Strategic Forces.
April 10, 2013	Shaheen I (Hatf-IV)	900 km	Solid-fuel, single-stage ballistic missile	The missile incorporates a series of improvements in range and technical parameters. The range was mentioned as 900 km.



November 5, 2013	Nasr (Hatf-IX)	70 km	Surface-to-surface, solid-fuel, Tactical Nuclear Missile (TNW)	The test fire was conducted with successive launches of 4 x Missiles from a Multi-Tube Launcher with Salvo Mode. Nasr has in-flight manoeuvre capability and is a quick response system, with shoot-and-scoot attributes. Nasr has been specially designed to defeat all known Anti-Tactical Missile Defence Systems. It contributes to the full spectrum deterrence against the prevailing threat spectrum.
April 22, 2014	Ghaznavi (Hatf-III)	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile	The successful launch concluded the Field Training Exercise of Strategic Missile Group of Army Strategic Forces Command.
May 8, 2014	Ghaznavi (Hatf-III)	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile	The test launch was the culminating point of the Field Training Exercise of Army Strategic Forces Command which was aimed at testing the operational readiness of a Strategic Missile Group besides up gradation of various capabilities of Weapon Systems.

September 26, 2014	Nasr (Hatf-IX)	70 km	Surface-to-surface, solid-fuel, Tactical Nuclear Missile (TNW)	The official statement was same as November 5, 2013 test. No significant developments.
November 13, 2014	Shaheen II (Hatf -VI)	1,500 km	Road-mobile, solid-fuel, surface-to-surface ballistic missile	Aimed at achieving Full Spectrum Credible Minimum Deterrence. Under development; expected to become operational soon.
November 17, 2014	Shaheen-1A	900 km	Solid-fuel, road-mobile ballistic missile	Aimed towards achieving Pakistan's Full Spectrum Credible Minimum Deterrence Capability.
February 2, 2015	Ra'ad	350 km	Turbojet-powered, subsonic Air Launched Cruise Missile (ALCM)	No details about the test are available on ISPR website. According to a media report, the Pakistani Army described the missile as a low altitude, terrain hugging missile with Strategic standoff capability. <sup>1</sup>
March 9, 2015	Shaheen-III	2,750 km	Surface-to-surface, two-stage, solid-fuel ballistic missile.	The test launch was aimed at validating various design and technical parameters of the weapon system at maximum range. The missile is under development by National Defence Complex. <sup>2</sup>

<p>April 15, 2015</p>	<p>Ghauri (Hatf-V)</p>	<p>1,300 km</p>	<p>Road-mobile, Liquid-fuelled, single-stage ballistic missile</p>	<p>Unlike solid-fuel missiles, liquid-fuelled ballistic missiles cannot store the fuel for long periods and have to be refuelled prior to launch, which takes several hours, thus making them vulnerable to first strikes. Given the relative lack of Pakistan's strategic depth, such systems are not the first choice for nuclear warhead delivery—a possible reason that Ghauri remains the only liquid-fuelled system in Pakistan's missile inventory and no other liquid-fuelled missile was developed after Ghauri. It is believed to be a variant of North Korea's Nodong-1/Rodong-1 missile.</p>
<p>December 11, 2015</p>	<p>Shaheen-III</p>	<p>2,750 km</p>	<p>Surface-to-surface, two-stage, solid-fuel ballistic missile.</p>	<p>The flight test was conducted with its impact point in the Arabian Sea.</p>

December 15, 2015	Shaheen-1A	900 km	Solid-fuel, road-mobile ballistic missile.	Shaheen-1A is claimed to have a sophisticated and advanced guidance system which makes it a highly accurate missile system. The flight test was aimed at revalidating several design and technical parameters of the weapon system.
January 19, 2016	Ra'ad (Hatf-8)	350 km	Turbojet-powered, subsonic Air Launched Cruise Missile (ALCM)	The missile enables Pakistan to achieve air delivered strategic standoff capability on land and at sea. Terrain hugging capability of the missile enables it to avoid detection and engagement by contemporary defence systems.
December 14, 2016	Babur-2/1(B)	700 km	Ground Launched Cruise Missile (GLCM)	Pakistan conducted successful test of an enhanced version of the indigenously developed Babur (Hatf-7) Cruise Missile. Babur Weapon System version 2 incorporates advanced aerodynamics and avionics that can strike targets both at land and sea with high accuracy.

<p>January 9, 2017</p>	<p>Babur-3</p>	<p>450 km</p>	<p>Submarine-Launched Cruise Missile (SLCM)</p>	<p>First successful test fire of the Submarine Launched Cruise Missile (SLCM). Babur-3 is a sea-based variant of Ground Launched Cruise Missile (GLCM) Babur-2. The missile will provide Pakistan with a Credible Second-Strike Capability. Once operational the Babur-3 will provide Pakistan with a nuclear triad.</p>
<p>January 24, 2017</p>	<p>Ababeel</p>	<p>2,200 km</p>	<p>Surface-to-surface, three-stage, solid-fuel ballistic missile</p>	<p>First successful flight test. The missile has MIRV technology. Aim is to ensure survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence (BMD) environment. Ababeel Missile System has ushered in a new era in technological sophistication of Pakistan's strategic capabilities.</p>

July 5, 2017	Nasr (Hatf-IX)	70 km	Surface-to-surface, road-mobile, solid-fuel, Tactical Nuclear Missile (TNW)	Nasr is a high-precision weapon system with the ability of quick deployments. Chief of Army Staff (COAS) said “Nasr has put cold water on Cold Start.”
February 11, 2018	Nasr (Hatf-IX)	70 km	Surface-to-surface, road-mobile, solid-fuel, Tactical Nuclear Missile (TNW)	The system is a quick reaction “shoot-and-scoot” missile. Nasr has been specially designed to defeat all known Anti-Tactical Missile Defence Systems.
March 29, 2018	Babur-3	450 km	Submarine-Launched Cruise Missile (SLCM)	The missile was fired from an underwater dynamic platform. The missile is claimed to have technologies like underwater controlled propulsion, advanced guidance and navigation features. It was stated that once operational, SLCM Babur will provide Pakistan Credible Second-Strike Capability, augmenting the existing deterrence regime.

<p>April 14, 2018</p>	<p>Babur-2/1(B)</p>	<p>700 km</p>	<p>Low flying, terrain hugging Ground Launched Cruise Missile, which also carries certain stealth features.</p>	<p>An enhanced range version of the indigenously developed Babur Cruise Missile. Equipped with TERCOM and DSMAC, thus making it an important force multiplier for Pakistan's strategic deterrence. Babur Weapon System-1 (B) incorporates advanced aerodynamics and avionics that can strike targets both at land and sea.</p>
<p>October 8, 2018</p>	<p>Ghauri (Hatf-V)</p>	<p>1,300 km</p>	<p>Road-mobile, Liquid-fuelled, single-stage ballistic missile</p>	<p>The launch consolidates Pakistan's nuclear capability through a credible deterrence regime.</p>

January 24, 28 and 31, 2019	Nasr (Hatf-IX)	70 km	Surface-to-surface, solid-fuel, Tactical Nuclear Missile	<p>January 24: This Weapon System has augmented Full Spectrum Deterrence posture remaining within the precincts of policy of Credible Minimum Deterrence.</p> <p>Tested quad salvo on January 24, and single shots on January 28 and 31, 2019.</p> <p>According to ISPR statement, the second phase of this exercise was aimed at testing the extreme in-flight manoeuvrability, including the end-flight manoeuvrability</p> <p>It was also claimed that the Nasr is capable of defeating, by assured penetration, any currently available BMD system.</p>
May 23, 2019	Shaheen-II	1,500 km	Road-mobile, solid-fuel, surface-to-surface ballistic missile.	The training launch of the missile was conducted to ensure operational readiness of Army Strategic Forces Command.
August 29, 2019	Ghaznavi/Hatf-3	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile	It was a night training launch. Ghaznavi, capable of delivering multiple types of warheads.



November 18, 2019	Shaheen-I	650 km	Surface-to-surface, solid-fuel, single-stage ballistic missile	Capable of delivering all kinds of warheads. As claimed by ISPR press statement, the test ensures Pakistan's Credible Minimum Deterrence.
January 23, 2020	Ghaznavi	290 km	Road-mobile, surface-to-surface, solid-fuel, single-stage ballistic missile.	The latest missile test by Pakistan Army comes days after India test-launched the submarine-launched K-4 ballistic missile. According ISPR the test was aimed at rehearsing operational readiness procedures during day and night.
February 18, 2020	Ra'ad-II	600 km	Nuclear capable Air Launched Cruise Missile (ALCM)	The test is claimed to have enhanced the air delivered strategic standoff capability of the military on land and at sea.

Notes: \*Pakistan Army Strategic Forces Command operates Hatf-II (Abdali), Hatf-III (Ghaznavi), Hatf-IV (Shaheen-1), Hatf-V(Ghauri), Hatf-VI (Shaheen), Babur Cruise Missile and Ra'ad Missile.

1. "Pakistan successfully test fires new stealth cruise missile", First Post, February 2, 2015 <https://www.firstpost.com/world/pakistan-successfully-test-fires-new-stealth-cruise-missile-2075503.html>
2. National Defence Complex (NDC) or National Development Complex is the primary facility of Pakistan's nuclear weaponisation programmes including missile development programmes. NDC has designed and improved several models of Pakistan's missile including Hatf-2/ Abdali, Hatf-3/Ghaznavi, Hatf-4/Shahen-1, Hatf-6/Shahen-2 missiles and Hatf-7/Babur, Pakistan's first land attack cruise missile.

## CAPABILITY ASSESSMENT

### *Ballistic Missile Capability*

Presently, Pakistan has six types of surface-to-surface nuclear capable ballistic missiles. Among these missiles, Ababeel, Shaheen-1A and Shaheen-III are under development. The ballistic missile inventory also contains six operational nuclear capable missiles, this includes relatively short-range Abdali, Ghaznavi, Shaheen-I and Nasr and the medium-range Ghauri and Shaheen-II. In this, Ghauri is the only liquid fuel missile system; all other ballistic missiles are solid propellant systems.

In the last ten years Pakistan has added four new land-based ballistic missile systems to its already existing missile systems. This includes, addition of Shaheen-III with a range of 2,750 km, Shaheen-1A with a range of 900 km, tactical nuclear missile Nasr with a range of 60 km which was upgraded to 70 km, and the relatively long-range ballistic missile Ababeel (range 2,200 km). With this Pakistan's ballistic missile inventory contains three relatively short-range ballistic missiles, i.e., Nasr, Ghaznavi and Abdali and six relatively longer-range missiles, i.e., Ghauri, Shaheen-I, Shaheen-1A, Shaheen-II, Shaheen-III and Ababeel.

The development of land-based ballistic missile force in the last decade also includes eight or nine missile garrisons, including four or five along the Indian border for short-range systems (Babur, Ghaznavi, Shaheen-I, Nasr) and three or four other garrisons further inland for medium-range systems (Shaheen-II and Ghauri).<sup>7</sup>

Several flight tests of each of these systems have been conducted over the past ten years to achieve improved performance, targeting and accuracy parameters. In order to understand these developments in the past one decade, the following detailed analysis presents some significant and newly developed missiles in Pakistan's missile inventory.

**Nasr (Hatf IX):** Among the new additions in Pakistan's ballistic missile inventory, one of the most significant developments is tactical nuclear weapon

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7. Ibid.

(TNW) Nasr (Hatf-IX). Nasr missile was developed to counter India's "Cold Start" doctrine. As, Pakistan's nuclear weapons development accelerated, it decided to use nuclear weapons as a shield behind which it could support terrorist groups fighting India, both in Jammu and Kashmir and other parts of India. Pakistan's strategy behind this was using the threat of escalation to the nuclear level to keep India from considering a full-scale conventional response to Pakistan's support for terrorism.<sup>8</sup>

The Indian Army introduced the Cold Start doctrine in 2004 after the Kargil War and the 2001 terrorist attack on the Indian Parliament with the objective of launching a swift, conventional limited strike against Pakistan in response to Pakistan's proxy war in the form of terrorist attack on Indian soil.<sup>9</sup> Under the Cold Start doctrine, a massive Indian offensive in terms of six to eight Integrated battle groups (IBGs) launched over a wide front significantly increases the challenge for Pakistani intelligence's limited reconnaissance assets to monitor the status of all the IBGs, improving the chance of surprise.<sup>10</sup> In response to this, Pakistan developed TNWs in an attempt to lower the nuclear threshold by using low-yield battlefield nuclear weapon Nasr. Thus, according to Pakistani thinking, one of the methods of increasing

**Pakistan developed TNWs in an attempt to lower the nuclear threshold by using low-yield battlefield nuclear weapon Nasr. Thus, according to Pakistani thinking, one of the methods of increasing conventional deterrence is through the introduction of low-yield nuclear weapons.**

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8. Rajesh Rajagopalan, "India's Doctrinal Options" in Gurmeet Kanwal and Monica Chansoria, eds., *Pakistan's Tactical Nuclear Weapons*, (New Delhi: KW Publishers, 2014) in association with Centre for Land Warfare Studies, New Delhi.

9. For more information on Cold Start Doctrine refer to Rajaram Nagappa, Arun Vishwanathan and Aditi Malhotra, "Hatf-IX/NASR—Pakistan's Tactical Nuclear Weapon: Implications for Indo-Pak Deterrence", Report no. R17-2013, July 2013, International Strategic and Security Studies Programme, National Institute of Advanced Studies, Bangalore, accessed on January 11, 2020.

10. Arun Sahgal, "Logic and Options for Use" in Gurmeet Kanwal and Monica Chansoria, eds., *Pakistan's Tactical Nuclear Weapons*, (New Delhi: KW Publishers, 2014) in association with Centre for Land Warfare Studies, New Delhi.

conventional deterrence is through the introduction of low-yield nuclear weapons. It is in this context that Pakistan's decision to develop TNW should be seen. Pakistan appears willing to pay the price to make nuclear deterrence more effective at the conventional level by taking tactical risk.<sup>11</sup>

The significance of this missile system in Pakistan's nuclear posture is evident from the fact that the missile has been tested the most (eight times) in the past one decade. The first successful test launch of the short-range, surface-to-surface, solid-fuel quick reactionary shoot-and-scoot tactical ballistic missile system Nasr (Hatf-IX) was conducted on April 19, 2011. The latest version of Nasr is capable of delivering a low-yield nuclear weapon to a range of up to 70 km, at initial stage the declared range was 60 km. The US intelligence community has listed Nasr as a deployed system since 2013.<sup>12</sup>

After the first test flight of the missile in April 2011, Pakistan's Inter-Services Public Relations (ISPR) stated that "The missile has been developed to add deterrence value to Pakistan's Strategic Weapons Development programme at shorter ranges."<sup>13</sup> But with a range of 60 km (at initial stage), the weapon system appears to be more suitable for theatre specific battlefield use rather than use against cities or strategic target and for the same reason, the Nasr seems to fall under the category of tactical or non-strategic weapon, rather than weapon intended for strategic deterrence. Also, some experts state that the missile launcher used during the test had similarities with Chinese DF-10 ground-launched cruise missile or A-100 multiple rocket launcher.<sup>14</sup>

In the later phase of development during the May 2012 test, Pakistan described the Nasr as a "weapon of peace... which will consolidate Pakistan's deterrence capability at all levels of the threat spectrum", a likely reference to Nasr's intended use in limited conventional warfare to seek parity with

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11. Ibid.

12. National Air and Space Intelligence Centre (NASIC). 2013. "Ballistic and Cruise Missile Threat." [https://fas.org/programs/ssp/nukes/nuclearweapons/NASIC2013\\_050813.pdf](https://fas.org/programs/ssp/nukes/nuclearweapons/NASIC2013_050813.pdf).

13. ISPR report No. PR-94/2011-ISPR, April 19, 2011, accessed on November 29, 2019.

14. Hans M. Kristensen, Robert S. Norris and Julia Diamond (2018), "Pakistani nuclear forces", 2018, *Bulletin of the Atomic Scientists*, 74:5, 348-58.

India's conventional force.<sup>15</sup> The test was followed by another one in May 2013 from a multi-tube launcher, where the weapon system was claimed to have "in-flight manoeuvre capability" and for the first time the missile system was also claimed to contribute towards full spectrum deterrence, a concept which was first anticipated during the first test of Nasr in 2011.<sup>16</sup> Pakistan explains its need for full spectrum deterrence capability to put forward a threat to deter India of varied ranges of missiles and at all levels of the threat spectrum. The doctrine elucidates Pakistan's evolving counterforce targeting options with the inclusion of tactical nuclear weapon to deter limited Indian conventional military operations at the lowest level of engagement (counterforce targeting).

Successive test launches of Nasr were conducted in September 2014, July 2017 and January 2019. In 2017 an enhanced range (70 km) version of the missile was tested and the ISPR statement noted that "the missile system will augment credible deterrence against [the] prevailing threat spectrums more effectively, including anti-missile defences."<sup>17</sup> The statement is a direct indication of Pakistan's rising concern about survivability of its missile systems, at a time when India has been developing and procuring a range of ballistic missile defence systems. Also, the test launch came after former Indian Army Chief General Bipin Rawat's public acknowledgment of the existence of Cold Start doctrine during an interview, as he stated that "The Cold Start doctrine exists for conventional military operations."<sup>18</sup>

The latest three tests (till January 2020) of the Nasr were conducted in January 2019. The ISPR press release noted that the "exercise was aimed at testing the extreme inflight manoeuvrability, including the end flight

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15. ISPR report No PR-130/2012-ISPR, May 29, 2012, <https://www.ispr.gov.pk/press-release-detail.php?id=2075>.

16. ISPR report No PR-179/2013-ISPR, November 5, 2013, <https://www.ispr.gov.pk/press-release-detail.php?id=2409>.

17. ISPR report No PR-344/2017-ISPR, July 5, 2017, <https://www.ispr.gov.pk/press-release-detail.php?id=4097>.

18. Sandeep Unnithan, "We will cross again" an interview with India's newly appointed Army Chief General Bipin Rawat, *India Today*, January 7, 2017, <https://www.indiatoday.in/magazine/interview/story/20170116-lt-general-bipin-rawat-surgical-strikes-indian-army-985527-2017-01-04>.

**Claim by Pakistan of using Nasr against India’s ballistic missile defence (BMD) system is ambiguous considering the fact that India’s BMD system is intended to be installed primarily near New Delhi and in a later phase near Mumbai to provide necessary missile shield to these important cities.**

manoeuvrability.”<sup>19</sup> It also claimed that the missile system offers security against “adversary’s ballistic missile defence system and other air defence systems”. Here, it is important to note that the credibility of Nasr missile against missile defence systems was not mentioned before the September 2014 test. With the development and procurement of India’s ballistic missile defence systems over the last decade, the Nasr missile is now being further considered to provide security against the missile defence systems. Also, the missile tests came days after the US released the 2019 Missile Defence Review,

which noted that “There are now a number of states in South Asia that are developing an advanced and diverse range of ballistic and cruise missile capabilities. Within this context, the United States has discussed potential missile defense cooperation with India.”<sup>20</sup>

Here, it is noteworthy that the claim by Pakistan of using Nasr against India’s ballistic missile defence (BMD) system is ambiguous considering the fact that India’s BMD system is intended to be installed primarily near New Delhi and in a later phase near Mumbai to provide necessary missile shield to these important cities. Whereas, the primary objective of Nasr missile system is to use it in battlefield for counterforce targeting. Moreover, the range of Nasr missile is too small to reach these cities where BMD systems will be installed.

**Abdali (Hatf-II):** Apart from Nasr, Pakistan has deployed another short-range, land-based, single-stage, dual-capable ballistic missile, the Abdali (Hatf-II) with declared range of 180 km. The Abdali programme began in

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19. ISPR report No PR-37/2019-ISPR, January 31, 2019, <https://www.ispr.gov.pk/press-release-detail.php?id=5179>.

20. *Missile Defense Review*, Department of Defense, United States of America, <https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF>.

the 1980s but was terminated in 1994. In 1997, Pakistan restarted work on a new design for the missile with a reduced range and flight testing resumed in 2002.<sup>21</sup> After a long gap of several years, the SRBM was tested again in March 2011, March 2012 and February 2013. ISPR stated that, “The weapon system with its varied manoeuvrability options provides an operational level capability to Pakistan’s Strategic Forces” in addition to the already existing “strategic and tactical level capability”,<sup>22</sup> although its use as operational nuclear weapon to engage objects in the operational depth of the enemy deployment might be limited considering its relatively small warhead limits. But its high-precision ability could be used to target military targets and critical infrastructures. The system is also claimed to be highly accurate and capable of carrying nuclear and conventional warheads. After three successful tests the missile is believed to have been first deployed in 2015.<sup>23</sup> An article in *The Washington Quarterly* noted that with the development of Nasr and Abdali, Pakistan has opted for flexible response and these systems will help in escalation control by preventing use of countervalue nuclear weapons at the early stage of conflict.<sup>24</sup>

As displayed in a military parade in 2015 the missile was carried on a road-mobile Transporter Erector Launcher (TEL) vehicle.<sup>25</sup> As the missile is solid-fuel, this road-mobile launcher offers the advantage of effective mobility, thus increasing its evasiveness and range.

Along with Abdali, Pakistan also has other missile systems which have been developed pre-2010, i.e., solid-fuel ballistic missile Ghaznavi with a

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21. Shannon N. Kile, Phillip Schell and Hans M. Kristensen, “Pakistani Nuclear Forces”, *SIPRI Yearbook 2012: Armaments, Disarmament and International Security*, pp. 337-40.

22. ISPR report No PR-20/2013-ISPR, February 15, 2013, <https://www.ispr.gov.pk/press-release-detail.php?id=2242>.

23. “Pakistani nuclear forces”, January 2018, *SIPRI Yearbook 2018: Armaments, Disarmament and International Security*. p. 274.

24. Sadia Tasleem and Toby Dalton, “Nuclear Emulation: Pakistan’s Nuclear Trajectory”, *The Washington Quarterly*, 41:4, 135-55, 2008, <https://doi.org/10.1080/0163660X.2018.1558662>, accessed on January 16, 2020.

25. Missile Defense Project, “‘Hatf-2’ ‘Abdali’, *Missile Threat*, Center for Strategic and International Studies, October 25, 2016, last modified June 15, 2018, <https://missilethreat.csis.org/missile/hatf-2/.COPY>.

**Pakistan’s National Defence Complex is developing the Ababeel ballistic missile that is claimed to have multiple independently targetable re-entry vehicle (MIRV) capabilities. The solid-fuel, three-stage missile with a reported range of 2,200 km was unveiled on January 24, 2017.**

range of 290 km, the air launched cruise missile Ra’ad with a range of 350 km, Shaheen-1 with a range of 650 km and ground launched cruise missile Babur-2 with a range of 700 km. While potential counterforce deployment of these missiles is uncertain, the Abdali and Ghaznavi are particularly noteworthy because of their potential operational level capability. They allow Pakistan to launch on lofted trajectories, thereby avoiding operational risks like preemptive attack and degradation or loss of command and control, which are associated with forward deployments. These missiles

can carry payloads greater than the Nasr, and thus can be armed with higher-yield warheads.<sup>26</sup>

**Ababeel:** Pakistan’s National Defence Complex is developing the Ababeel ballistic missile that is claimed to have multiple independently targetable re-entry vehicle (MIRV) capabilities. The solid-fuel, three-stage missile with a reported range of 2,200 km was unveiled on January 24, 2017. The official statement noted that the “missile is capable of delivering multiple warheads, using MIRV technology... Development of Ababeel Weapon System is aimed at ensuring survivability of Pakistan’s ballistic missiles in the growing regional Ballistic Missile Defence (BMD) environment.”<sup>27</sup> Pakistan’s claim of MIRV technology has not been verified and remains a point of debate. It is also not certain if the technology was used during the test launch. MIRV technology requires a broad degree of technical sophistication and Pakistan might have taken

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26. Jaganath Sankaran, “The Enduring Power of Bad Ideas: ‘Cold Start’ and Battlefield Nuclear Weapons in South Asia.” *Arms Control Today*, vol. 44, no. 9, 2014, pp. 16–21. JSTOR, [www.jstor.org/stable/24336477](http://www.jstor.org/stable/24336477). Accessed on February 2, 2020.

27. ISPR report No PR-34/2017-ISPR, January 24, 2017, <https://www.ispr.gov.pk/press-release-detail.php?id=3705>



external assistance to successfully develop it. Analysts note that Pakistan would have had to overcome a number of technical challenges before claiming to develop successful MIRV technology. Similarly, miniaturised warhead is a requirement for MIRV system but till date Pakistan has not demonstrated any such capability.<sup>28</sup> Since its introduction in 2017, no other tests of the Ababeel missiles are known to have taken place (till January 2020) which also indicates that the missile system is at a nascent stage of development and requires more testing before successful deployment. In this regard, in 2018 it was reported that China has sold Pakistan a powerful tracking system that could boost Pakistan's development of missiles that are capable of delivering multiple warheads.<sup>29</sup> The Chinese Academy of Science announced the deal and specified that, "An optical system is a critical component in missile testing. It usually comes with a pair of high-performance telescopes equipped with a laser ranger, high-speed camera, infrared detector and a centralised computer system that automatically captures and follows moving targets."<sup>30</sup> This report further strengthens the possibility of external assistance for the development of MIRV technology.

**Shaheen-I:** Shaheen-I is a single stage, solid-fuel ballistic missile with a range of 650 km that has been in service since 2003. Since 2010, the missile system has been test fired twice in 2013 and 2019. The missile is launched from road-mobile TELs.

Since 2012, Pakistan's National Defence Complex is developing additional variant of Shaheen missile. An extended range version of the Shaheen-I missile—Shaheen-1A is under development with an estimated range of 900 km. In 2013, a test launch of Shaheen-I missile was conducted

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28. Rajaram Nagappa, "Does Pakistan's Ababeel Medium Range Ballistic Missile Really Have MIRV Capability?", *Delhi Defence Review* (blog), February 3, 2017, <http://delhifencereview.com/2017/02/03/does-pakistans-ababeel-medium-range-ballistic-missile-really-have-mirv-capability/>

29. Stephen Chen, "China provides tracking system for Pakistan's missile programme", *The South China Morning Post*, March 22, 2018, <https://www.scmp.com/news/china/society/article/2137643/china-provides-tracking-system-pakistans-missile-programme>. Accessed on February 4, 2020.

30. Ibid.

**Pakistan is also developing a road-mobile, solid-fuel, two-stage ballistic missile—Shaheen-III with a range of 2,750 km and conducted two test launches of the missile in 2015. The range of the missile will reportedly enable it to reach almost all of India and deep into west Asia, including Israel.**

and the range was reported as 900 km. But in the subsequent test in November 2019, the reported range was brought back to 650 km. This indicates that the test launch in 2013 was most possibly conducted for Shaheen-1A missile and not the Shaheen-I. Shaheen-1A was most recently reported test launched in December 2015 after it was tested in April 2012 and November 2014. During the 2015 test the missile was claimed to have “sophisticated and advanced guidance system” that makes it a highly accurate missile system.<sup>31</sup> With this development Pakistan acquires another relatively long-range ballistic missile with

already existing liquid-fuelled ballistic missile Ghauri (Hatf-V).

Besides this, the National development complex is also developing two other variants of Shaheen missile series—Shaheen-II and Shaheen-III. The solid-fuel, two-stage Shaheen-II has been under development for many years. The system was first tested on March 2004 and become operational in 2014. The missile is reportedly based on DF 11 (also known as CSS-7), a Chinese short-range ballistic missile. In the April 2008 test it was declared “longest range ballistic missile system with a range of 2000 km.” whereas after the 2014 and 2019 tests ISPR reported the range as 1,500 km. ISPR described the November 2014 test as a milestone towards consolidating Full Spectrum Credible Minimum Deterrence.<sup>32</sup>

Pakistan is also developing a road-mobile, solid-fuel, two-stage ballistic missile—Shaheen-III with a range of 2,750 km and conducted two test launches of the missile in 2015. The range of the missile will reportedly enable

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31. ISPR report No PR-382/2015-ISPR, December 15, 2015, <https://www.ispr.gov.pk/press-release-detail.php?id=5507>.

32. ISPR report No. PR-248/2014-ISPR, November 13, 2014, <https://www.ispr.gov.pk/press-release-detail.php?id=2701>.

it to reach almost all of India and deep into west Asia, including Israel. According to Pakistan's Gen. Kidwai, the missile is being developed to cover all parts of India including Andaman and Nicobar Islands that are "being developed as strategic bases."<sup>33</sup> The missile system is in development phase and requires more testing before it can become operational. It is also speculated by observers that the Shaheen solid-fuel ballistic missile series will replace liquid-fuelled ballistic missile system Ghauri, but the trend of flight tests of the Ghauri missile—four times in the past decade, indicates that the missile system might not be withdrawn from Pakistan's missile inventory in the near future.

**The first cruise missile of Pakistan was a subsonic, ground launched cruise missile, the Babur. It was developed by Pakistan's National Engineering and Scientific Commission (NESCOM) and tested for the first time in 2005. Many analysts believe that Pakistan took external assistance as the design of the missile bears similarities with Chinese cruise missiles.**

### CRUISE MISSILE CAPABILITY

In recent years Pakistan is making significant progress in its cruise missile capabilities. Its cruise missile inventory consists primarily of land, air and submarine-based cruise missiles. It has Ground Launched Cruise Missile (GLCM)—Babur (Hatf-7), Air Launched Cruise Missiles (ALCM)—Ra'ad (Hatf-8) and Submarine Launched Cruise Missile (SLCM) (Babur-3). Recently, in April 2018, an enhanced range version of ground launch cruise missile Babur, Babur weapon system-2/1 (B), and in February 2020 extended range version of air launched cruise missile Ra'ad—Ra'ad II were tested. All of these, Babur-2/1 (B), Ra'ad II and SLCM Babur-3 are currently under development.

**Babur (Hatf-7):** The first cruise missile of Pakistan was a subsonic, ground launched cruise missile, the Babur. It was developed by Pakistan's National

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33. Carnegie Endowment for International Peace. 2015. "A Conversation with Gen. Khalid Kidwai." Carnegie International Nuclear Policy Conference 2015. Transcript. March 23, p. 10, <http://carnegieendowment.org/files/03-230315carnegieKIDWAI.pdf>.

Engineering and Scientific Commission (NESCOM) and tested for the first time in 2005. Many analysts believe that Pakistan took external assistance as the design of the missile bears similarities with Chinese cruise missiles and the US Tomahawk missile. According to ISPR press release Babur missile “incorporates the most modern cruise missile technology of Terrain Contour Matching (TERCOM) and Digital Scene Matching and Area Co-relation (DSMAC).”<sup>34</sup> Terrain-contour-matching (TERCOM) is a missile guidance system in which a map stored in the missile’s computer is continuously compared with the actual terrain to locate the missile’s position relative to the target.

The missile has been tested four times in the past ten years, twice in 2011 and twice in 2012. The range of the missile has been enhanced over the period of its development. During the inaugural test in August 2005 the range of the missile was declared as 500 km, whereas in October 2011 the missile was claimed to have an operational range of 700 km,<sup>35</sup> although many analysts believe that the range is not more than 350 km.<sup>36</sup> Similarly, since October 2011, the missile was launched from a multi-tube missile launch vehicle that “enhances targeting and deployment options in the conventional and nuclear mode.”<sup>37</sup>

The ISPR press report stated both the Babur and Ra’ad missile systems are “low altitude terrain hugging missile(s) with high manoeuvrability” with “pin point accuracy” and “stealth capability”.<sup>38</sup> An enhanced range version of Babur missile known as Babur-2/1(B) is under development.<sup>39</sup> It was test launched

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34. ISPR report No. PR-256/2011-ISPR, October 28, 2011, <https://www.ispr.gov.pk/press-release-detail.php?id=1889>. Accessed on February 24, 2020.

35. ISPR report No. PR-143/2012-ISPR, June 5, 2012, <https://www.ispr.gov.pk/press-release-detail.php?id=2088>

36. Hans M. Kristensen, Robert S. Norris and Julia Diamond (2018), “Pakistani nuclear forces”, 2018, *Bulletin of the Atomic Scientists*, 74:5, 348-58, DOI: 10.1080/00963402.2018.1507796.

37. ISPR report No. PR-256/2011-ISPR, October 28, 2011, <https://www.ispr.gov.pk/press-release-detail.php?id=1889>.

38. ISPR report No. PR-135/2012-ISPR, May 31, 2012, <https://www.ispr.gov.pk/press-release-detail.php?id=2080>.

39. ISPR report No. PR-482/2016-ISPR, December 14, 2016, <https://www.ispr.gov.pk/press-release-detail.php?id=3632>.

twice in December 2016 and April 2018. A recent test launch of the missile in March 2020 suffered a setback. As the range of both Babur and “enhanced range version” Babur-1(B) are reported as 700 km, it can be estimated that the range of the initial system might be shorter than the stated range (700 km).

As per official statement, the Babur-2/1(B) weapon system has advanced aerodynamics and avionics that can strike targets both at land and sea. The Babur-2/1(B) system with almost the same features and advanced capability might replace the relatively older version, the Hatf-7. Although, considering the current state of development, it is likely to take significant time before it gets fully operationalised.

A recent report speculated that Pakistan’s nuclear storage facility at the Arabian Sea port, Ormara has undergone massive expansion; it is believed that the facility is used to store the Babur missile system.<sup>40</sup> According to the report a recent satellite image has shown that the facility has expanded from an initial size of 425 acres in 2018 to almost 1,000 acres area post 2018, which shows the rapid pace of cruise missile capability enhancement by Pakistan.

**Ra’ad (Hatf-8):** Pakistan has been developing the Air Launched Cruise Missile (ALCM) Ra’ad (Hatf-8) since 2007. The missile with a range of 350 km has been flight tested four times since 2011 and test launches have been conducted from Mirage III combat aircraft, although some reports indicate that the missile might have been integrated with JF-17 aircraft.<sup>41</sup> Ra’ad is claimed to have low altitude terrain hugging capability with high manoeuvrability which enables it to avoid detection and engagement by missile defence systems. While, during the latest test of the missile in January 2016, it was mentioned by ISPR that the missile system is equipped with advanced navigation and guidance system, no particular information regarding the type of the guidance system has been stated yet. According

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40. Col. Vinayak Bhat (Retd.), “Pakistan Navy’s nuke storage facility at Arabian Sea port of Ormara sees massive expansion”, *The Print*, December 3, 2019, <https://theprint.in/defence/pakistan-navys-nuke-storage-facility-at-arabian-sea-port-of-ormara-sees-massive-expansion/329370/>.

41. *SIPRI Yearbook 2018*, “Armaments, Disarmament and International Security”, p. 277, <https://www.sipri.org/sites/default/files/SIPRIYB18c06.pdf>.

to the official statement the missile system enables Pakistan to achieve air delivered strategic standoff capability on land and at sea.

In the 2017 military parade, Pakistan displayed ALCM Ra'ad-II with a range of 550 km.<sup>42</sup> The missile system was tested for the first time in February 2020 with a stated range of 600 km which "significantly enhances air delivered strategic standoff capability on land and at sea."<sup>43</sup> The increase in range would allow the missile to hit targets at a greater distance. Pakistan's need to develop a longer range cruise missile with terrain hugging capability and high accuracy to avoid detection might be driven by India's modernisation of its air defence system by procuring systems such as S-400. The same is quite evident from the fact that the test was conducted days after the US Department of State approved possible sale of an Integrated Air Defence Weapon System (IADWS) to India.

After the February 2020 test of Ra'ad-II, some reports suggest that the rear of the missile might have undergone significant design changes with new intake and control surfaces to make it fit to launch from diverse range of combat aircraft, including Chinese supplied JF-17 fighter aircraft. This will help in replacing the aging Mirage as the Pakistani forces primary strike platform. Similarly, in 2017 the Pakistan Aeronautical Complex, which manufactures JF-17 combat aircraft, mentioned about integration of standoff weapon with JF-17. This makes the possibility of using JF-17 to launch Ra'ad missile even stronger. Apart from this, both missile systems (Babur and Ra'ad) are structurally much smaller and slimmer than Pakistan's ballistic missile systems, which might be an indicator of Pakistan's capability of warhead miniaturisation based on plutonium instead of uranium.<sup>44</sup>

**Babur-3:** In order to achieve a secure second-strike capability and complete nuclear triad, Pakistan is developing a sea-based variant of GLCM

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42. Bilal Khan, "Pakistan Officially Unveils Extended Range Ra'ad 2 Air-Launched Cruise Missile." Quwa Defence News & Analysis Group. March 23, 2017, <https://quwa.org/2017/03/23/pakistan-officially-unveils-extended-rangeraad-2-air-launched-cruise-missile/>.

43. ISPR report No. PR-27/2020-ISPR, February 18, 2020, <https://www.ispr.gov.pk/press-release-detail.php?id=5625>.

44. Hans M. Kristensen, Robert S. Norris and Julia Diamond, "Pakistani nuclear forces", 2018, *Bulletin of the Atomic Scientists*, 74 (5), pp. 348-58.

Babur-2, the SLCM Babur-3 with a range of 450 km.<sup>45</sup> The missile is under development and was flight tested twice in January 2017 and March 2018. The first test of the missile was conducted in January 2017 from an undisclosed location in the Indian Ocean. During the March 2018 test the missile was launched from “an underwater dynamic platform”.<sup>46</sup> Some studies predict that the missile was most likely launched from the diesel-electric Agosta-90B (Khalid class) submarine in service with the Pakistan Navy.<sup>47</sup>

The future submarine-based nuclear capability is managed by Headquarters Naval Strategic Forces Command (NSFC), which the government said in 2012 would be the “custodian of the nation’s 2nd strike capability” to “strengthen Pakistan’s policy of Credible Minimum Deterrence and ensure regional stability”.<sup>48</sup> Successful development of SLCM Babur-3 will provide Pakistan with complete nuclear triad and therefore it will have land, air and sea-based nuclear strike platforms. Given the fact that Pakistan does not have a nuclear-powered submarine, potential deployment of the SLCM and its ability to work in full capacity might get affected as the operational superiority of nuclear-powered submarine over diesel power submarine makes it a more effective launch platform for submarine launched missiles. However, in 2016, Pakistan signed a deal with China to buy eight Yuan class diesel-electric attack submarines. It was also reported that these submarines will have the air-independent propulsion system.<sup>49</sup> The submarines are expected to be completed between 2023 and 2028. These submarines might be a significant addition in Pakistan’s submarine fleet, considering the fact

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45. ISPR report No. PR-10/2017-ISPR, January 9, 2017, <https://www.ispr.gov.pk/press-release-detail.php?id=3672>.

46. ISPR report No. PR-125/2018-ISPR, March 29, 2018, <https://www.ispr.gov.pk/press-release-detail.php?id=4660>. Accessed on January 21, 2020.

47. Rajaram Nagappa, et al., “Babur-3—Pakistan’s SLCM: Capability and Limitations”, *Air Power Journal*, vol. 13 no. 3, Monsoon 2018 (July-September). Accessed on January 5, 2020.

48. Hans M. Kristensen, Robert S. Norris and Julia Diamond, “Pakistani nuclear forces”, *Bulletin of the Atomic Scientists*, 2018, 74:5, 348-58, DOI: 10.1080/00963402.2018.1507796.

49. Zia Mian, M. V. Ramana and A. H. Nayyar, “Nuclear Submarines in South Asia: New Risks and Dangers”, *Journal for Peace and Nuclear Disarmament*, 2019, 2:1, 184-202, DOI: 10.1080/25751654.2019.1621425.

**From the current trend it can be observed that in the last decade, Pakistan has mainly focused on developing ballistic missile systems ranging from 70 km to 290 km and 900 km to 2,750 km.**

that many modern attack submarines can launch cruise missiles while remaining underwater and its air independent propulsion system could significantly contribute to effective stealth capability. Apart from this, Pakistan may be also seeking to build a nuclear-powered submarine, although it is unclear if any work on this front has taken place yet.<sup>50</sup>

#### **FUTURE TRAJECTORIES AND CONCLUSION**

With the development of nuclear missile inventory, Pakistan's nuclear posture has undergone a steady transformation in the last decade. As Pakistan's posture evolves to greater numbers and variants of missile systems, it also incorporates terms like secure second strike capability, nuclear triad and full spectrum deterrence capability to define its nuclear posture. These advances in terms of nuclear posture and inclusion of new technologies have many implications for India and the South Asian region per se.

Pakistan's nuclear and missile developments are India-centric and essentially seek to deter India's air and missile defence system and conventional force superiority. With incessant development of dual-capable missiles of varied range and warheads in recent years, specifically particular emphasis on development of relatively short-range dual capable systems like Nasr, Abdali and Ghaznavi is a matter of concern as use of these systems in a limited conventional war could potentially lower the threshold of the nuclear conflict. Also, further development and operationalisation of these systems will invariably result in strategic instability.

Pakistan's use of the terms like "quick reactionary, shoot-and-scoot missile" to describe its TNW Nasr, likely indicates a quick response or ease of use of this missile. Which is also a possible projection that in wake of a

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50. Ibid.



conflict situation Islamabad will not hesitate to use these weapon systems in the first place to gain strategic advantage.

From the current trend it can be observed that in the last decade, Pakistan has mainly focused on developing ballistic missile systems ranging from 70 km to 290 km and 900 km to 2,750 km. Pakistan's newly added MIRV capable missile and cruise missile systems with improved guidance and terrain hugging stealth technology significantly raise India's threat perception, especially when Pakistan operationalises and deploys these systems effectively with the obvious foreign assistance of China.

If Pakistan successfully develops MIRV capability with China's assistance, mutual threat perception is likely to grow further. MIRV capability provides the attacking state with disarming counterforce strike capability and with greater accuracy. MIRV systems indicate essentially first strike capability rather than retaliatory capability. With increased tendency for crisis, all of these developments could have a negative impact on regional deterrence stability.

The above analysis clearly indicates that in the last decade, Pakistan has taken significant strides in its nuclear and missile development programme. Diversity of these systems suggest that its nuclear missile development programme to build a nuclear triad and to achieve full spectrum deterrence will continue to grow in coming years. Although, Pakistan may require several test launches before effectively operationalising many of its missile systems, the rapid pace of development with supposed external assistance, majorly from China, indicates that it might not take much time before it fully develops these capabilities.

Similarly, in view of the present advances and diversity of these systems it is likely that its nuclear missile development programme to

**Although, Pakistan may require several test launches before effectively operationalising many of its missile systems, the rapid pace of development with supposed external assistance, majorly from China, indicates that it might not take much time before it fully develops these capabilities.**

build a nuclear triad and to achieve full spectrum deterrence capability will continue to expand in the near future. In the coming years, Pakistan will increasingly focus on developing and strengthening missile systems like Nasr, Ababeel, Shaheen, Air Launched Cruise Missile Ra'ad-2 and sea-based deterrents.

# UNDERSTANDING JAPAN'S NUCLEAR POWER DILEMMA AND ASSESSING ITS FUTURE TRAJECTORY

ZOYA AKHTER FATHIMA

## INTRODUCTION

In the Japanese language, nuclear power plants are called 'atomic energy power plants'. They refer to the word '*Genshi*' which means atomic, instead of using the word '*Kaku*' which means nuclear.<sup>1</sup> This may seem like a fairly insignificant observation, but the choice of words more often than not has remarkable connotations. The choice of words in Japanese language appears to be deliberate in order to create a clear distinction between nuclear weapons (where *kaku* is used) and nuclear power for peaceful purposes (where it is referred to as *genshi*). Subtle differences in words could imply different emotions, especially in the context of Japan, which is the only country in the world to have experienced the brutality of nuclear weapons and hence chooses to use a less distressing word.

With the Fukushima nuclear disaster in 2011, Japan once again experienced the dangers of nuclear technology. Since then the Japanese government has been under immense pressure with regard to issues of its energy policies. While the

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1. Scott Wilson, "Haruki Murakami's Solution to Nuclear Power Debate: Just Call It 'Nuclear Power'", *Japan Today*, April 10, 2015, <https://japantoday.com/category/national/haruki-murakamis-solution-to-nuclear-power-debate-just-call-it-nuclear-power>. Accessed on December 24, 2019.

**While the Japanese government wants nuclear power to play an important role in the national energy basket, the resumption of operations of nuclear power reactors, following approval by the Nuclear Regulation Authority, seems to be exceedingly slow.**

Japanese government wants nuclear power to play an important role in the national energy basket, the resumption of operations of nuclear power reactors, following approval by the Nuclear Regulation Authority, seems to be exceedingly slow. This seriously affects the clean energy goals that Japan hopes to achieve by 2030, by increasing the share of coal powered electricity.

Amidst this challenge, there is also widespread cynicism regarding nuclear power among the Japanese public that has been calling for a phase-out of nuclear power. Opposition parties have been trying to exploit these sentiments to garner public support for the next elections. In addition, there is the huge financial strain of not only the clean-up costs of the Fukushima accident but also to make up for the lost energy supply.

In this context this paper aims to assess the various challenges faced by Japan and its possible future nuclear energy trajectory. To do so, the paper is divided into three parts. The first part sets a background by tracing the development of nuclear power in Japan and outlines the major developments in civil nuclear energy from the 1940s to 2011. The second part will focus on the Fukushima accident in 2011. It will study how the accident happened, its effects and the efforts made by the government to deal with the crisis. The third part will study the effect of Fukushima on the future of energy policies in Japan and tries to understand if the rising civil activism can translate into policy change.

## **PART A: TRACING THE DEVELOPMENT OF JAPAN'S CIVIL NUCLEAR PROGRAMME: 1945-2000**

### *Understanding the Reasons that Led Japan to Develop Civil Nuclear Energy*

It was astonishing for many when Japan—a seismically active country—decided to develop a civil nuclear energy programme within a decade

of witnessing the horrors of a nuclear war. There were several compelling reasons why Japan developed its civil nuclear programme. Primarily, it was due to the lack of natural resources. During the post-war period, Japan relied heavily on imported oil and coal. Developing a civil nuclear programme, therefore, was seen as necessary to create an indigenous energy resource, reduce energy dependency and provide supply stability. The war also had a dire effect on the economy. It is said that the Second World War pushed back about 50 years of development in Japan.<sup>2</sup> To make up for this, Japan embarked upon an ambitious course to develop the economy. This was witnessed in the income doubling

plan during the 'Golden 60s'. However, for the economy to revive, it was imperative to fulfil the soaring demand for electricity. Post-war Japan depended on hydroelectricity and coal to generate electricity, which did not suffice. Hydroelectric plants, which generated much interest among the Japanese policymakers, then faced several challenges such as high operational costs, maintenance issues, regular droughts, lack of sites for dams, etc. This did lead also to a search for alternate energy sources.

At that time, Prime Minister Yoshida Shigeru put forth the 'Yoshida Doctrine'. The doctrine stated the importance of rapid economic development fuelled by technological advancement. Nuclear energy found prominence here. In addition, in the 1940s, the electrical system in Japan was in its early development stage and families were allowed only a couple of lightbulbs.<sup>3</sup>

**Post-war Japan depended on hydroelectricity and coal to generate electricity, which did not suffice.**

**Hydroelectric plants faced several challenges such as high operational costs, maintenance issues, regular droughts, lack of sites for dams, etc. This did lead also to a search for alternate energy sources.**

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2. Craig Nelson, "'The Energy of a Bright Tomorrow': The Rise of Nuclear Power in Japan", *Origins*, vol. 4, issue 9, June 2011, <https://origins.osu.edu/article/energy-bright-tomorrow-rise-nuclear-power-japan>. Accessed on February 2, 2020.

3. Olga Belogolova, *National Journal*, "Why Japan Can't Quit Nuclear Power", *The Atlantic*, February 14, 2020, <https://www.theatlantic.com/politics/archive/2013/02/why-japan-cant-quit-nuclear-power/437028/>. Accessed on February 22, 2020.

Thus, the parable of abundant electricity through nuclear energy which was 'too cheap to meter', had a strong appeal and brought in hope that this would be the energy revolution that Japan so critically needed.

Furthermore, Japan also had the institutional capacity to develop a nuclear power industry. It was one of the countries that had embarked on projects to develop nuclear weapons during the Second World War. Further research on nuclear technology, however, was banned by the United States after the War, including research and development of nuclear technology for peaceful purposes such as for medical applications. With the end of American occupation of Japan in 1952, the scope for the development of nuclear R&D emerged once again. However, it only developed with the 'Atoms for Peace' programme introduced by US President Dwight Eisenhower.

The Atoms for Peace Programme was first announced in 1953 in a speech at the United Nations by Eisenhower, but came into fruition in 1957 with the establishment of the International Atomic Energy Agency (IAEA). Through this programme, the US disseminated nuclear technology to friendly countries.<sup>4</sup> The Programme had multiple strategic objectives. Primarily, it was designed to regulate nuclear energy. It aimed to prevent the proliferation of nuclear weapons technology and apply the expertise for peaceful purposes such as electricity generation, medical applications, etc. The programme was also designed to cultivate friendship with other countries and demonstrate the material benefits of allying with the United States. In 1955, Japan signed an atomic energy cooperation agreement with the US. Apart from providing assistance to Japan to develop their civil nuclear programme, it aimed at rebranding the image of nuclear power as not just destructive but also beneficial.

### *Japan's 'Kaku Arerugi' or Nuclear Allergy*

Unsurprisingly, the Japanese people had developed a social condition called *Kaku Arerugi* or Nuclear Allergy.<sup>5</sup> Nuclear technology remained a taboo and

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4. M. J. Medhurst, "Atoms for Peace and Nuclear Hegemony: The Rhetorical Structure of a Cold War Campaign", *Armed Forces and Society*, 23(1), pp. 571-93. Accessed on January 20, 2020.

5. Daniel P. Aldrich, "Post-Crisis Japanese Nuclear Policy: From Top-Down Directives to Bottom-Up Activism", *East West Center*, n. 103, January 2012, <https://www.Eastwestcenter.Org/Sites/Default/Files/Private/Api103.Pdf>. Accessed on January 22, 2020.

so the idea of developing a civil nuclear power programme was not met with public support. In addition, even before Japan could sign a formal agreement with the US, the *Daigo Fukuryū Maru* or the Lucky Dragon Number 5 accident furthered fears about nuclear power. On March 1, 1954, a fishing boat called 'Lucky Dragon Number 5', with twenty-three men aboard got contaminated by a nuclear fallout from a thermonuclear weapons test by the United States in the Bikini Atoll. All the men aboard fell ill and suffered from acute radioactive sickness and one of them even died because of it. In addition, sixteen tonnes of contaminated tuna from the same boat had been sold in various markets before the vessel reached Tokyo. Fears of invisible poison alarmed the people and an atmosphere of fear and panic once again gripped Japan.<sup>6</sup> Newspapers, both locally and internationally, reported the incident extensively. A newspaper called *Asahi* reported that the Japanese people had thus suffered from nuclear bombs for the third time.<sup>7</sup> This incident triggered immense protests against nuclear weapons globally. It was in this context, in order to placate the Japanese government—along with other strategic objectives as discussed earlier—that the US government offered nuclear technology to Japan. During this time, the first anti-national nuclear movement was created in Japan known as *Gensuikyō*. This petition against nuclear weapons gained over 20 million signatures.

The situation in Japan worried the US president, Dwight Eisenhower, who sent a memorandum to the Secretary of State asking “what things can we and should we do to improve our prospects in that region?” The then acting Secretary of State Robin Murphy replied, “The Japanese are pathologically sensitive about nuclear weapons. They feel they are the chosen victims of such weapons ... in the long run, scientific interchange is the best remedy for Japanese emotion and ignorance and we intend to push such projects ... the most important thing we can do to help is to treat Japan as a full, free-world counsels. This is essential if we are to count upon the use of Japanese bases and their cooperation in any future conflict...”<sup>8</sup>

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6. Craig Nelson, n. 2.

7. Noriko Manabe, *The Revolution Will Not Be Televised: Protest Music after Fukushima* (UK: Oxford University Press, 2015), p. 37.

8. *Ibid.*

While the US was placating the Japanese government and planning the construction of several nuclear power plants, popular protests and petitions continued.

### *Managing Dissent*

To manage dissent and garner the support of the public, the Japanese government developed several approaches. Soft control tools such as providing subsidies, incentives and creating favourable narratives of nuclear power were undertaken. Other examples included conducting annual fairs in Yokohama where only communities that hosted nuclear power plants could sell their products. In order to address concerns about food contamination that had affected the farmers and fishermen's business significantly, jobs were offered to the fishermen community for giving up their sea rights in certain areas.<sup>9</sup> The government also created a programme called *Dengen Sanpō* or "The Three Power Source Development Laws." Under this programme, money was collected from an invisible tax on all electricity use across the country. This funded about US\$ 20 million per annum to communities that agreed to host nuclear power plants.<sup>10</sup> In addition, the government organised public relations campaigns in order to create a positive image of nuclear technology.

As discussed in the beginning of the paper, the Japanese government uses two different words for nuclear energy. *Kaku* in the context of nuclear weapons and *Genshi* in the context of civil nuclear energy. It could be argued that this is not deliberate and is just a translation muddle as they do not make such distinction in the English language. But this is perhaps because this distinction is directed inwards at its domestic audience. Internationally, using 'atomic' or 'nuclear' in different contexts does not have the same effect since 'atomic bomb' and 'nuclear bomb' in the English language is used interchangeably. In this regard, Hiroaki Koide, assistant professor of nuclear

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9. Daniel P. Aldrich, "With a Mighty Hand", *newrepublic.com*, March 19, 2011, <https://newrepublic.com/article/85463/japan-nuclear-power-regulation>. Accessed on February 3, 2020.

10. *Ibid.*



engineering at the Kyoto University Research Reactor Institute, stated in an interview with Hiroshima Peace Media Center, that “The government calls what Japan does as ‘*genshi ryoku kaihatsu*’ (atomic energy development), but they refer to what Iran does as ‘*kaku kaihatsu*’ (nuclear development). But in English they both use the word ‘nuclear.’ The government of Japan has used different terms for the two, but ‘*kaku*’ (nuclear power) and ‘*genshi ryoku*’ (atomic energy) are the same.”<sup>11</sup> Semantics, in this regard, plays an

**The worldwide promotion of ‘peaceful’ nuclear energy was intended to whitewash the bad image of nuclear technology and clear the way for a broad public acceptance. In Japan, this idea was taken up well—especially by politicians and companies anticipating influence, power and big profits.**

important role in creating narratives and implying emotions. This was well recognised by the Japanese leaders, especially at a time when they wanted to develop their civil nuclear programme, amidst widescale protests. Dr. Alex Rosen, in this regard, states, “In the process of producing weapons-grade plutonium, huge amounts of energy were generated—energy which could be used to produce electricity. The worldwide promotion of ‘peaceful’ nuclear energy was intended to whitewash the bad image of nuclear technology and clear the way for a broad public acceptance. In Japan, this idea was taken up well—especially by politicians and companies anticipating influence, power and big profits. In Japan, politics and economy were traditionally closely connected. In the case of nuclear power, however, the proximity between companies, politicians and comptrollers soon exceeded every acceptable limit. But first, public scepticism had to be placated. The proponents of nuclear energy knew about the importance of semantics in Japanese thinking, and therefore first modified the language: While the word ‘nuclear’ in ‘nuclear bomb’ had been translated with the Japanese word ‘*kaku*’ (‘core’), the word ‘*genshi-ryoku*’ (‘nuclear power’) was chosen for ‘peaceful’ nuclear energy.

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11. Yumi Kanazaki and Yoko Yamamoto, “Fukushima and Hiroshima: Impact on the A-bombed city, Part 3”, *Hiroshima Peace Media Center*, July 25, 2011, <http://www.hiroshimapeacemedia.jp/?p=28547>. Accessed on March 2, 2020.

Only due to this linguistic differentiation was it possible to contextually separate the civil from the military nuclear industry in the heads of many Japanese, even though both industries were closely enmeshed in reality ..."<sup>12</sup>

The United States also played an important role in influencing the Japanese public to change their perceptions and attitude towards nuclear power. Recently declassified documents reveal that the CIA played an important role in swaying the public opinion in favour of nuclear energy.<sup>13</sup> They did this in cooperation with the crème de la crème of Japanese society, including politicians and media moguls. Psychological operations and public perception management programmes included movies and travelling exhibitions that propagated the potential benefits of nuclear energy. Newspapers frequently featured articles that described modern societies powered by nuclear energy, featuring technological innovations such as nuclear powered cars and electronics. The growing interest in nuclear energy even began reflecting in popular culture. An example of this is the '*Tetsuwan Atomu*' comics, literally translating to iron-armed atom or as Astro Boy in other parts of the world. Interestingly, nuclear weapons are evidently absent in the series. Instead, the theme revolved around peaceful use of nuclear power as the series illustrated a nuclear powered fantasyland.<sup>14</sup>

### *Development of Civil Nuclear Capabilities*

Efforts at managing dissent and creating positive narratives of nuclear power proved to be considerably effective. The government's success rate at building power plants amidst the protests was considered to be around 50 percent. That is, for every two attempts made by the government to construct nuclear power plants, one went through.<sup>15</sup> Even the public attitude

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12. Dr. Alex Rosen, "Yin and Yang—why Japan accepted nuclear energy despite Hiroshima and Nagasaki", IPPNW, <https://www.ippnw.eu/print/en/abolition-of-nuclear-weapons/artikel/aa4d551dedbd49773584c5a89842cbee/yin-and-yang-why-japan-accepted.html>. Accessed on May 1, 2020.

13. Richard Krooth, Morris Edelson and Hiroshi Fukurai, *Nuclear Tsunami: The Japanese Government and America's Role in the Fukushima Disaster* (United States: Lexington Books, 2015), p. xv.

14. Craig Nelson, n. 2.

15. Daniel P. Aldrich, n. 9.

towards nuclear power programme was slowly beginning to change.

By 1955 Japan began its national nuclear programme with the passing of the Atomic Energy Basic Law. This law stipulated three principles: democratic methods, independent management, and transparency as the foundation of nuclear research activities. The Japan Atomic Energy Commission (JAEC) was set up in 1956 along with several other related organisations such as the Nuclear Safety Commission (NSC), the Science and Technology Agency, Japan Atomic Energy Research Institute (JAERI) and the Atomic Fuel Corporation.<sup>16</sup> Because of the limits on export of nuclear technology by the US in the earlier days, Japan initially took the help of Great Britain who helped in the construction of the first commercial nuclear power reactor in Japan in Tokaimura in 1956.<sup>17</sup> The construction of the British designed Magnox reactor began in 1961 and was completed in 1965. In 1966 Japan officially began commercialising nuclear generated electricity. Japan also soon shifted its focus to US designed light-water reactors.

Research and development in nuclear technology too developed rapidly in Japan. Eventually, Japanese companies purchased plant designs from the US and received licences to build similar designs with the help of Japanese companies. Soon enough they were developing their own designs and manufacturing technologies.<sup>18</sup> By 1973, Japan had five nuclear reactors. However, over seventy percent of its energy continued to come from oil. Thus,

**By 1973, Japan had five nuclear reactors. However, over seventy percent of its energy continued to come from oil. Thus, when the OPEC countries imposed a global oil embargo, Japan was subjected to the oil shock. Realising the vulnerability of high oil dependency, nuclear energy started gaining greater support.**

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16. "Nuclear Power in Japan", world-nuclear.org, <https://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx>. Accessed on March 25, 2020.

17. Kennedy Maize, "A Short History of Nuclear Power in Japan", powermag.com, March 14, 2011, <https://www.powermag.com/blog/a-short-history-of-nuclear-power-in-japan/>. Accessed on March 30, 2020.

18. n. 16.

when the OPEC countries imposed a global oil embargo, Japan was subjected to the oil shock. Realising the vulnerability of high oil dependency, nuclear energy started gaining greater support. This provided Japan further impetus to develop its civil nuclear programme. Furthermore, nuclear power became less competitive in the 1970s and 1980s, as inflation and interest rates rose due to the oil crisis.<sup>19</sup>

Although development in civil nuclear energy was swift, it was not free of challenges. In the 1970s and 1980s the nuclear industry was in a state of flux. The Three Miles Island nuclear accident in 1979 and the Chernobyl nuclear accident in 1986 had once again set off concerns of nuclear safety. The Japanese government however continued its backing for civil nuclear power. To ensure that their energy policy was not affected by the crises, they underplayed the graveness of the accidents. For example, at the 12th Group of Seven Summit, which was chaired by Tokyo two days after the Chernobyl accident, Japan tried to tone down discussions about the accident. Declassified records show that references to concerns of “radiation” were deleted from the draft of the G7 summit. But, the final statement spoke about how nuclear power would be “an energy source that will be ever more widely used in the future.”<sup>20</sup> In the 1990s several accidents took place at the nuclear facilities which the authorities tried to hush up. This again led to more protests as public trust in nuclear technology was beginning to erode.

However, Japan was able to successfully deal with public mistrust as their civil nuclear programme burgeoned. By 2010 Japan had 55 operational, commercial nuclear power reactors, which produced about one-third of the country's electricity. Japan also became the world's third largest producer of nuclear power. With a successful experience in civil nuclear energy, Japan had ambitious plans for the future. However, the fateful accident at the

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19. “Responses after Chernobyl and Fukushima—Comparative Analysis of Germany and The Netherlands as Amplified Examples”, *Laka.org*, March 5, 2012, <https://www.laka.org/info/publicaties/2012-chernobyl-fukushima.pdf>. Accessed on February 5, 2020.

20. “Japan downplayed Chernobyl concerns at G-7 for energy policy's sake, documents show”, *The Japan Times*, December 20, 2017, <https://www.japantimes.co.jp/news/2017/12/20/national/history/japan-downplayed-chernobyl-concerns-g-7-energy-policys-sake-declassified-documents/>. Accessed on January 28, 2020.

Fukushima Daiichi nuclear power plant in 2011 did not only undo Japan's accomplishments in civil nuclear energy but also impacted the global nuclear energy industry drastically.

### **PART B: THE FUKUSHIMA DAIICHI NUCLEAR DISASTER**

On March 11, 2011, the Tōhoku earthquake measuring a magnitude of 9.0 hit Japan's northeast coast. The impact of the earthquake was so huge that it shifted the earth on its axis. Fortunately, the eleven reactors in four different nuclear power plants that were operating in that expanse could brave the earthquake.<sup>21</sup> No significant damage was done to the nuclear power plants and all the reactors automatically shut down. However, soon after, the plants at Fukushima were struck by one of the largest tsunamis to ever occur in the history of the planet. Over 19,000 people died because of the tsunami which also caused severe damage to several towns in the region.<sup>22</sup> The Fukushima Daiichi power plant which is situated in that area too became vulnerable to it, because of the insufficient sea wall surrounding the power plant. It disabled the power supply and the cooling system of three reactors in the power plant. Typically, even if the power supply does not transmit electricity, the emergency generators work as a backup to supply power. However, the tsunami had knocked even the generators out of action.<sup>23</sup> This led to three cores significantly melting and hydrogen explosions. Numerous aftershocks followed. Fortunately, this did not create any more significant damage to the power plants.

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21. "2011 Japan earthquake and tsunami: Facts, FAQs, and how to help", worldvision.org, <https://www.worldvision.org/disaster-relief-news-stories/2011-japan-earthquake-and-tsunami-facts>. Accessed on December 26, 2020.

22. "Fukushima Daiichi Accident", World-Nuclear.org, <https://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident.aspx>. Accessed on February 10, 2020.

23. Naoto Kan, *My Nuclear Nightmare: Leading Japan through the Fukushima Disaster to a Nuclear-Free Future* (New York: Cornell University Press, 2017), p. 4.

**The Fukushima accident was rated 7 on the International Nuclear Event Scale. It is the only accident to be given the high classification, apart from the 1986 Chernobyl nuclear accident. Although thousands of people died because of the earthquake and the tsunami, there were no casualties due to the accident at the nuclear power plant.**

*Effects of the Fukushima Nuclear Accident*

The Fukushima accident was rated 7 on the International Nuclear Event Scale. It is the only accident to be given the high classification, apart from the 1986 Chernobyl nuclear accident. Although thousands of people died because of the earthquake and the tsunami, there were no casualties due to the accident at the nuclear power plant. Several studies have pointed out that there are no cases of radiation induced cancer due to the accident. The findings of the 2014 report by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) and the World Health Organisation also state that

there is no evident increase in cancer rates because of the Fukushima accident.<sup>24</sup> However, the health effects of the Fukushima nuclear disaster are disputed. Currently, there are many ongoing studies trying to determine if the accident had any veiled health effects.

Meanwhile, there is little doubt that the psychological effect of the accident on the people has been dire. Trauma from the calamities, anxiety due to the dislocation, separation from family, and fear of radiation caused immense distress to the residents. In this regard Shunichi Yamashita, a Japanese medical scientist, stated: "We know from Chernobyl that the psychological consequences are enormous. Life expectancy of the evacuees dropped from 65 to 58 years—not (predominantly) because of cancer, but because of depression, alcoholism and suicide. Relocation is not easy, the stress is very big. We must not only track those problems, but

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24. "Increase in Cancer Unlikely following Fukushima Exposure—Says UN Report", Unisvienna.org, April 2, 2014, <http://www.unis.unvienna.org/unis/en/pressrels/2014/unisous237.html>. Accessed on February 18, 2020.

also treat them. Otherwise, people will feel they are just guinea pigs in our research.”<sup>25</sup>

The nuclear disaster also had environmental repercussions. It resulted in hydrogen-air chemical reactions which led to the release of highly radioactive material in the surrounding area.<sup>26</sup> However, since the radiation diffused quickly, the amount of radioactive dosage that the wildlife in the area received decreased speedily.<sup>27</sup> A large amount of water too was contaminated with radioactive isotopes. This contaminated water was released into the Pacific Ocean. However, considering the inherent resilience of the ecosystem and the quick diffusion of radioactive isotopes, radio-ecologists do not expect it to cause severe ecological danger or cause damage to the food chain.<sup>28</sup>

The economic consequence of the accident was quite harsh too. It is estimated that the direct costs of the accident will be approximately US\$ 15 billion in clean-up in the next two decades and more than US\$ 60 billion in refugee compensation.<sup>29</sup> Apprehension regarding residual radiation also posed a challenge to the mostly agriculture-based economy in the region. Worried about contaminated produce, in the ensuing months, about 54 of Japan’s trading partners employed trade embargoes on Japan.<sup>30</sup>

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25. “Studying the Fukushima Aftermath ‘People Are Suffering from Radiophobia’”, *Spiegel International*, August 18, 2011, <https://www.spiegel.de/international/world/studying-the-fukushima-aftermath-people-are-suffering-from-radiophobia-a-780810.html>. Accessed on February 20, 2020.

26. Dylan Sarkisian, “Effect of Fukushima Nuclear Disaster on Japanese Ecosystems”, large.stanford.edu, February 20, 2017, <http://large.stanford.edu/courses/2017/ph241/sarkisian1/>. Accessed on February 18, 2020.

27. Ibid.

28. Ibid.

29. James Conca, “Shutting Down All of Japan’s Nuclear Plants after Fukushima Was a Bad Idea”, *Forbes*, October 31, 2019, <https://www.forbes.com/sites/jamesconca/2019/10/31/shutting-down-japans-nuclear-plants-after-fukushima-was-a-bad-idea/#456d88f919a4>. Accessed on January 29, 2020.

30. Elliot Waldman, “The Unlearned Lessons of Japan’s Fukushima Nuclear Disaster”, *World Politics Review*, March 20, 2019, <https://www.worldpoliticsreview.com/insights/27673/the-unlearned-lessons-of-japan-s-fukushima-nuclear-disaster>. Accessed on February 20, 2020.

### *Lapses that Led to the Nuclear Accident*

Naoto Kan, the former Prime Minister of Japan, in his book, *My Nuclear Nightmare*, states:

...it was my understanding at the time that the accident (in Chernobyl) occurred because the reactor was old and Soviet technology was inadequate. Because Japan possessed unparalleled nuclear technology and superior experts and engineers, I believed that a Chernobyl-type accident could not occur at a Japanese nuclear power plant. To my greatest consternation, I would come to learn that this was a safety myth created by Japan's 'Nuclear Village' (a vast and powerful network of vested interests).<sup>31</sup>

Rightly so, he raises the question of whether the Fukushima nuclear accident was avoidable. Natural calamities have occurred even before where nuclear power plants are sited, without causing significant damage, for example, the tornado in 1998 that hit the expanse where Davis-Besse nuclear power plant was situated, or Hurricane Andrew in 1992 on the Turkey Point Plant in Florida. In both cases, the emergency generators were able to keep the equipment functioning until the personnel could fix it.<sup>32</sup> More recently, Hurricane Harvey in Texas and Hurricane Dorian in Florida illustrated how nuclear power plants can brave natural calamities.<sup>33</sup> Even in the case of the most grave nuclear accident, the 1986 Chernobyl nuclear disaster, the incident is largely linked to the misadministration and corruption in Soviet Russia. This raises the question of whether nuclear energy is inherently dangerous, or are these accidents a result of carelessness and negligence?

Indeed, major probes into the Fukushima accident revealed several lapses in the system. This could be better understood by examining the Swiss Cheese

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31. n. 23, p. 2.

32. John Sullivan, "Can U.S. Nuclear Plants Handle a Major Natural Disaster?" *ProPublica*, March 13, 2011, <https://www.propublica.org/article/can-u.s.-nuclear-plants-handle-a-major-natural-disaster>.

33. James Conca, "Hurricane Harvey Makes the Case for Nuclear Power", *Forbes*, September 1, 2017, <https://www.forbes.com/sites/jamesconca/2017/09/01/hurricane-harvey-makes-the-case-for-nuclear-power/#1c50af43625f>. Accessed on October 15, 2019.



Model of Accident Causation. This model examines how safety systems can fail. It does so by comparing human systems to numerous slices of Swiss cheese that are set next to each other. The slices of cheese represent layers of defence. These layers of defence or safety barriers could be policies, physical security systems, etc. Every system, however, could have defects or weak points, which could lead to flaws in the functioning of the overall system. These are called latent conditions and active failures and could be in the form of bad designs, lacunae in administration or recklessness by the operators. Most often, the holes in the cheese are not aligned. Thus, even if one system fails, the probability of a hazard is mitigated by the different layers of defence systems or different slices of the cheese. The different layers or defence systems thus should be able to prevent a single point of failure. However, there can be cases where all of these defence systems fail, leading to a catastrophe.<sup>34</sup> This applies to the Fukushima nuclear disaster as well where several lapses cumulatively led to the unfortunate accident.

The first latent condition was the siting of the nuclear power plant. Located in the Pacific Ring of Fire, Japan is prone to earthquakes and volcanoes. Aware of this, the Japanese authorities had assured the citizens that no power plant would be constructed on top of active faultlines. However, advancement in studies on active faultlines over the years unearthed more active faultlines. Researchers constantly drew attention to the high likelihood of tsunami levels stretching beyond the levels that was assumed during the time of the construction. Tokyo Electric Power Company (TEPCO), the operators of the

**Located in the Pacific Ring of Fire, Japan is prone to earthquakes and volcanoes. Aware of this, the Japanese authorities had assured the citizens that no power plant would be constructed on top of active faultlines. However, advancement in studies on active faultlines over the years unearthed more active faultlines.**

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34. "Identifying error Swiss cheese model", YouTube, January 16, 2019, <https://www.youtube.com/watch?v=JRCMxfBULB4>. Accessed on February 21, 2020.

nuclear power plants at Fukushima, however, disregarded these warnings.<sup>35</sup>

The second latent condition was the age of the Fukushima Daiichi power plant. The first unit was built in 1968 and was set to be decommissioned in 2010. However, the Japan Nuclear and Industrial Safety Agency (NISA) granted permission to extend its operation by TEPCO for another ten years. Furthermore, many laxities by TEPCO were identified in having concealed several minor safety issues from the state regulators.<sup>36</sup> TEPCO even confessed to having not taken stronger safety measures in the fear of drawing lawsuits.<sup>37</sup>

Linked to this point is another latent condition of lack of transparency and accountability. Two weeks before the natural disasters struck Japan, several organisations, such as the Fukushima Environmental Protection Organisation and the Green Fukushima Future, presented petitions to TEPCO to divulge guarded information on plant safety.<sup>38</sup> In 2012 the official report of the Fukushima Nuclear Accident Independent Investigation Commission was released. It stated that

...the Commission concludes that there were organizational problems within TEPCO. Had there been a higher level of knowledge, training, and equipment inspection related to severe accidents, and had there been specific instructions given to the on-site workers concerning the state of emergency within the necessary time frame, a more effective accident response would have been possible...<sup>39</sup>

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35. The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, "The official report of the Fukushima Nuclear Accident Independent Investigation Commission", 2012, p. 27, [https://www.nirs.org/wp-content/uploads/fukushima/naiic\\_report.pdf](https://www.nirs.org/wp-content/uploads/fukushima/naiic_report.pdf). Accessed on February 24, 2020.

36. Georgui Kastchiev, Ed Lyman, Mycle Schneider, et al., "An Account of Events in Nuclear Power Plants Since the Chernobyl Accident in 1986", [large.stanford.edu](http://large.stanford.edu), May 2007, p. 26.

37. Martin Fackler, "Japan Power Company Admits Failings on Plant Precautions", *New York Times*, October 12, 2012, <https://www.nytimes.com/2012/10/13/world/asia/tepcu-admits-failure-in-acknowledging-risks-at-nuclear-plant.html>. Accessed on January 22, 2020.

38. n. 13, p. xvi.

39. n. 35.

The report also stated that the measures that were in place in case of a severe accident (SA) were feeble as they only accounted for internal errors and did not consider external factors such as natural calamities, although it is a widely known fact that Japan is prone to such natural calamities.<sup>40</sup>

*Crisis Management: The Eventual Steps taken by the Japanese Government*

In the aftermath of the accident, the Japanese government made vigorous efforts to manage the crisis. A few days after the accident, the government announced a larger evacuation zone around the nuclear facility due to the radioactive contamination that was being released into the atmosphere. About 150,000 residents were evacuated from the surrounding areas. The clean-up programme too began soon. First, measures were taken to cool down the facility by removing heat from the reactors and dealing with the overheated spent fuel ponds. The task to prevent the release of radioactive materials soon began. The Japanese government even revised laws and the 'Reconstruction Agency' was established in 2012. A 10-year time frame was set for reconstruction. Most of the infrastructure that was damaged by the earthquake has now been repaired.<sup>41</sup>

The Green Zone, where protective gear is not required, has considerably extended to cover 96 percent of the plant site.<sup>42</sup> Food products such as rice that is grown in the Fukushima prefecture were tested for radioactive contamination. Since 2015, all the produce has proven to have less than the standard amount of radioactivity. The same was proven for the marine products from the Fukushima prefecture.<sup>43</sup>

Another body that was set up was the 'Nuclear Regulation Authority' (NRA) in 2012. NRA was set up to be independent, unlike the previous organisation that worked along with the Ministry of Economy, Trade and

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40. n. 35.

41. "Efforts for Reconstruction of Tohoku", reconstruction.go.jp, <https://www.reconstruction.go.jp/english/>. Accessed on January 23, 2020.

42. Turner Jackson, "3Q: The future of nuclear energy in Japan", energy.mit.edu, May 29, 2019, <http://energy.mit.edu/news/3q-the-future-of-nuclear-energy-in-japan/>. Accessed on February 20, 2020.

43. n. 41.

Industry (METI). The newly formed NRA enforced what it called “the world’s most stringent requirements” for nuclear reactors to resume operation.<sup>44</sup> All nuclear facilities thus underwent stringent checks and adopted strict safety measures. The government, which had shut down all the nuclear power plants while these measures were in check, was ready to resume the operations of some reactors which had cleared safety prerequisites.

### **PART C: EFFECT OF FUKUSHIMA ON FUTURE ENERGY POLICIES**

Immediately after Fukushima, the mood of the nation was naturally anti-nuclear. The 2011 Energy White Paper which was approved by the Japanese Cabinet stated that there was public distrust of nuclear safety because of the Fukushima accident, and called for a reduction in their dependency on nuclear power.<sup>45</sup> Subsequently, 50 nuclear power reactors were shut down. Eventually, the government declared that they would phase out nuclear power plants by 2040, after the plants complete their operating lifespan. The immediate policy responses to Fukushima, however, evolved subsequently with changing leadership. In 2014, reversing the previous government’s decision, Prime Minister Shinzo Abe’s government declared that nuclear power generation would be restarted, once again, after getting approval by the regulators.<sup>46</sup> The New Energy Plan in 2014 which was approved by the Liberal Democratic Party Cabinet stated that nuclear power was “the country’s most important power source.”<sup>47</sup> The new policy even allowed the construction of new reactors.

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44. “Japan Commercial Guide”, International Trade Administration, <https://www.export.gov/article?id=Japan-Nuclear-Decommissioning>. Accessed on January 24, 2020.

45. Tsuyoshi Inajima and Yuji Okada, “Nuclear Promotion Dropped in Japan Energy Policy after Fukushima”, Bloomberg.com, October 28, 2011, <https://www.bloomberg.com/news/articles/2011-10-28/nuclear-promotion-dropped-in-japan-energy-policy-after-fukushima>. Accessed on February 27, 2020.

46. “Three years after Fukushima, Japan forges ahead with nuclear energy,” DW.com, April 11, 2014, <https://www.dw.com/en/three-years-after-fukushima-japan-forges-ahead-with-nuclear-energy/a-17560046>. Accessed on January 27, 2020.

47. “Japan reverses its withdrawal from nuclear power”, DW.com, April 13, 2014, <https://www.dw.com/en/japan-reverses-its-withdrawal-from-nuclear-power/a-17563405>. Accessed on January 27, 2020.

As of 2016, the biggest source of energy for Japan comes from fossil fuels (82 percent), followed by renewable sources (16 percent) and 2 percent from nuclear energy. The government is focused on rebalancing its energy basket and has set a target of reducing the share of fossil fuels to 56 percent and increasing the share of renewable sources to 22 percent and nuclear energy to 22 percent. These are extremely ambitious plans and would require fervent restoration and renovation of nuclear power. To achieve this, it would not only require to restart the existing power plants but also to construct new ones.<sup>48</sup> The Japanese government's impetus to revive its nuclear energy industry could be understood by examining several important factors, which could also help us in understanding the future trajectory of nuclear energy in Japan.

## **FACTORS THAT DETERMINE THE FUTURE TRAJECTORY OF NUCLEAR ENERGY IN JAPAN**

### *Japan's Energy Crisis*

One of the major reasons that Japan developed its civil nuclear energy programme, as discussed earlier, was because of its lack of domestic energy resources. Thus, when it suspended the operations of all its reactors after the Fukushima accident, it once again faced the same problem. Japan's domestic energy resources meet less than 15 percent of its total primary energy use.<sup>49</sup> The loss of its nuclear capacity has led Japan to modify its energy mix. This new energy mix places oil and natural gas at the forefront, which has further led to import dependency. Japan, thus, has become the world's largest importer of LNG, second largest importer of fossil fuel and third largest net importer of oil.<sup>50</sup> This has not only created dependency, but is also proving to be uneconomical, in addition to making Japan vulnerable to the geopolitics of energy.

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48. n. 42.

49. "Japan is the second largest net importer of fossil fuels in the world", US Energy Information Administration, November 7, 2013, <https://www.eia.gov/todayinenergy/detail.php?id=13711>. Accessed on January 29, 2020.

50. n. 3.

**The Fukushima accident had a grave effect on the country's economy. As Japan shut down its reactors, it had to import energy resources from other countries to fill the energy void. This led to Japan facing the worst trade deficit in its history.**

*Clean Energy Factor*

Fukushima pushed back Japan's plans to boost renewable energy in its energy basket. Dependency on fossil fuels to meet the urgent energy requirements after the accident has brought in the problem of increasing carbon emissions. Coal and Natural Gas amount to 74 percent of Japan's energy supply.<sup>51</sup> Japan wants to increase its share of renewables from the current 16 percent to about 24 percent by 2030. In planning to do so, it wants to increase nuclear energy output to about 22 percent from its current 3 percent (as per 2017).<sup>52</sup> This is

further linked to health issues. According to a study undertaken by Matthew Neidell, Shinsuke Uchida and Marcella Veronesi, the replacement of nuclear energy by fossil fuels after Fukushima led not just to increasing electricity prices but also to public mortality.<sup>53</sup> In some cases the increase in energy prices led to decrease in energy consumption which further increased death rates during extremely cold weather. Another cause for mortality stemmed from the burning of coal which causes respiratory problems. According to one study the combined number of deaths due to these factors are higher than the number of casualties from the earthquake and tsunami in Japan in 2011.<sup>54</sup> In this regard, David Weinstein from Columbia University states that "If Japan had decided to keep all [unaffected] nuclear reactors open in 2012 and had met its energy needs by proportionally reducing coal, oil, LNG and other energy sources, I estimate that this policy would have saved 9,493 lives based on the air pollution of that year alone." Although the instinctive reaction to shutting down nuclear reactors after Fukushima

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51. "Japan plans carbon emission cuts, more nuclear energy", *The Asahi Shimbun*, June 10, 2019, <http://www.asahi.com/ajw/articles/AJ201906100044.html>. Accessed on January 30, 2020.

52. Ibid.

53. n. 29.

54. n. 29.

seems understandable, the effects of it, however, have been dire.<sup>55</sup>

### *Economic Revival*

The Fukushima accident had a grave effect on the country's economy. As Japan shut down its reactors, it had to import energy resources from other countries to fill the energy void. This led to Japan facing the worst trade deficit in its history. From 2011-13 the cost of energy imports in Japan was US\$ 40 trillion and a trade deficit of US\$ 227 billion from April 2011 to March 2014.<sup>56</sup> In addition, the average electricity price also shot up to 25 percent in households and to 38 percent in industries.<sup>57</sup>

Some studies indicate that if Japan had continued with the decision of phasing out nuclear power, as the earlier government had envisaged, it would have ravaged the economy further. According to the Japanese Institute of Energy Economics, the fossil fuel imports would have set off an outflow of national wealth equivalent to 0.6 percent of Japan's gross domestic product.<sup>58</sup>

Furthermore, as there is a gradual increase in interest in nuclear energy by many countries around the world, the government and the nuclear industry hopes to export nuclear energy technology and infrastructure to these foreign markets. This would also help private companies in the nuclear energy field in Japan, which were leading nuclear technology and energy suppliers in the past. In addition, China and Russia have made rapid strides in providing

**In 2017 Japan and the US signed a Memorandum of Understanding to promote the global leadership roles of both the countries in the field of civil nuclear energy. Developing nuclear energy, thus, has once again become important to resuscitate Japan's economy.**

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55. n. 29.

56. Manual Herrera, "Nuclear energy challenges in Japan", *Global Risks Insight*, July 5, 2019, <https://globalriskinsights.com/2019/07/japan-nuclear-energy/>. Accessed on March 3, 2020.

57. "Japan's Energy 2018, 10 Questions to understand the current energy scenario", *Ministry of Economy, Trade and Industry Agency for Natural Resources and Energy*, June 2019, p. 3. Accessed on January 31, 2020.

58. n. 3.

nuclear technologies to newer markets at lower costs and creating spheres of energy dependency. The rising dominance of China and Russia in this field has thus raised concerns among several countries. This is perhaps why in 2017 Japan and the US signed a Memorandum of Understanding to promote the global leadership roles of both the countries in the field of civil nuclear energy. Developing nuclear energy, thus, has once again become important to resuscitate Japan's economy.

## CHALLENGES

While developing a sound strategy to revive nuclear power to make up for the energy deficit crisis and economic recovery, Japan has several challenges that it has to deal with effectively. Linked to each other, these disparate challenges require distinct and well-thought-out strategies.

### *Political Divergences*

The current Japanese government makes it abundantly clear that it considers nuclear energy to be an important component of its energy basket. However, their efforts to promote this objective is met with dissension and controversy. The opposition party has been taking advantage of the fears around nuclear technology and is using anti-nuclear rhetoric to consolidate public support in order to win the next elections. Apart from disapproval by the opposition party, disagreement within the party too has been a challenge. The new Environment Minister of Japan, Shinjiro Koizumi, has called for abandoning nuclear power for safety concerns. This could set him on a difficult course with the pro-nuclear ruling party.<sup>59</sup> In addition, despite the efforts by the government to restart the nuclear reactors, the progress has been very slow. They are delayed either because of the stringent safety regulation clearances or because of the several lawsuits that are calling to do away with nuclear power plants. At the same time,

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59. Justin McCurry, "Japan should scrap nuclear reactors after Fukushima, says new environment minister", *The Guardian*, September 12, 2019, <https://www.theguardian.com/world/2019/sep/12/japan-should-scrap-nuclear-reactors-after-fukushima-says-new-environment-minister>. Accessed on December 28, 2019.



old reactors are being decommissioned, which delays the much needed increase in nuclear output.

Restarting nuclear reactors is a complex process. In principle, approval from the NRA should suffice to start the reactor. However, there are political nuances to it as well. These utilities need the local government's authorisation under the Safety Agreement. This is based on trust and good faith between local governments and the utilities, and is not legally binding. In this regard, certain issues, such as evacuation for one is an impediment for restart-ups. This is because evacuation plans are not a subject of NRA licensing process. Thus, there is no clarity as to in whose dominion the appropriateness of evacuation plans lie, or even as to who determines it.<sup>60</sup>

### *Clean Up*

Nine years since the accident, a lot of clean-up work in the nuclear facility and around it has been done. Yet, a lot more remains. It appears to be a long-drawn-out process, as experts cite at least several decades to complete the job. Lake Barrett, senior advisor to TEPCO in this regard states, "It's of the magnitude of putting a man on the moon... Unless there's an acceleration, I would not be surprised if it takes 60 years or so."<sup>61</sup> Considering the complexities of the clean-up process and the scale of the project, more sophisticated and specialised technologies would be required. In this step, TEPCO and the Japanese government are now developing next generation robotics, to venture into parts of the facilities where humans cannot go due to high levels of radiation. But several challenges subsist even in this endeavour. Robots sent in earlier were damaged severely due to the high gamma radiation, and so a lot more research and development is required to develop the technology, taking into consideration the numerous complexities. Again, there lies the

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60. Tatsujiro Suzuki, "Nuclear Energy Policy after the Fukushima Nuclear Accident: An Analysis of 'Polarized Debate' in Japan", *intechopen.com*, February 6, 2019, <https://www.intechopen.com/online-first/nuclear-energy-policy-after-the-fukushima-nuclear-accident-an-analysis-of-polarized-debate-in-japan>. Accessed on January 31, 2020.

61. James Martin, "A rare look at the meltdown inside Fukushima Daiichi Nuclear Power Plant", *Cnet.com*, March 4, 2019. <https://www.cnet.com/news/inside-fukushima-daiichi-nuclear-power-station-nuclear-reactor-meltdown/>. Accessed on December 13, 2019.

problem of dealing with the contaminated water. While 62 out of the 63 radioactive elements have been successfully removed, the solution to remove one element called tritium—a radioactive isotope of hydrogen—is yet to be found. The decision to release the water into the sea also involves many complications. For example, it would not be taken well by the local fishermen who took years to revive their industry after the accident. In addition, South Korea has expressed concern over the effect it would have on its seafood. There also exist challenges such as lack of storage space for spent fuel and lack of storage of contaminated water, among others.

### *Anti-Nuclear Sentiments*

One of the biggest challenges that policymakers in Japan are facing today is lack of public trust. Unsurprisingly, and for well-founded reasons, nuclear fear has once again gripped the country. A poll that was undertaken in 2015 by Japan Atomic Energy Relations Organization reflects this fear. The results of the poll reveal that almost 50 percent of the respondents said that nuclear energy should be abolished gradually, and another 14.8 percent said that it should be abolished immediately. Only about 10 percent of the respondents believe that nuclear energy use should be continued and less than 2 percent of the respondents thought that it should increase.<sup>62</sup> In 2016, another survey was conducted by the Japanese newspaper, *Asahi Shimbun*. The results of this survey were even more disapproving of nuclear power, where 57 percent of the respondents were against the restarting of nuclear power plants even if they fulfilled all the safety requirements, and 73 percent of the respondents supported the phasing out of nuclear power altogether. Another 14 percent backed the immediate shutdown of the nuclear power plants.<sup>63</sup>

The lack of honesty by TEPCO officials which was revealed in the inquiries after Fukushima is one of the major causes for the lack of public confidence in the nuclear industry. Anti-nuclear protests drew out for a long time after the Fukushima accident. Newer, innovative initiatives also developed in

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62. Anne C. Cunningham (ed.), *Revisiting Nuclear Power* (Greenhaven Publishing LLC, 2017), p. 21.

63. *Ibid.*, p. 22.

this process. An example of this is the 'Safecast Project', which focuses on 'citizen science'. This inclusive set-up encourages citizens to participate in data collection, calculation and analysis in various fields such as ecology and biodiversity. Using modern, web-based platforms they carry out research themselves. Their research findings challenge the facts and figures given by the government and utilities such as TEPCO, the reliability of whose data collection and analysis methodology has been disputed.<sup>64</sup>

This stems from the lack of transparency of the power utilities and has damaged the credibility of TEPCO immensely. In this regard, Naomi Hirose, the former president and the current executive vice chairman of Fukushima Affairs at TEPCO, at an event in MIT Energy Initiative (MITEI) said, "Gaining public trust is the most important but challenging issue for TEPCO. To fulfil our responsibility to the people affected by the accident, we disclose all data related to the decommissioning operations to the public."<sup>65</sup>

Dissent in Japan, however, is a complex matter with several nuances. While the larger public mood is anti-nuclear they have not mobilised it forcefully.<sup>66</sup> While the protests were in full swing after the Fukushima accident, they have slackened over the years. This is perhaps because the efficacy of protests depends on the social and cultural attributes of the dissenters and the tools used by the officials. However, it could also be linked to other factors such as non-responsiveness from the government. An article in *Japan Times* by Mizuho Aoki covers various aspects of the anti-nuclear protests in Japan. One of the subjects she interviewed for the piece states, "I have a sense of crisis about the current state of things. I guess people are tired of speaking up, as nobody (in the government) seems to listen to them."<sup>67</sup> However, interestingly, the anti-nuclear factor was also not reflected in the elections. While most polls

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64. Daniel P. Aldrich, "Post-Crisis Japanese Nuclear Policy: From Top-Down Directives to Bottom-Up Activism", *East West Center*, n. 103, January 2012, pp. 7-8, <https://www.eastwestcenter.org/sites/default/files/private/api103.pdf>. Accessed on January 22, 2020.

65. n. 42.

66. Mizuho Aoki, "Down but not out: Japan's anti-nuclear movement fights to regain momentum", *The Japan Times*, March 11, 2016, <https://www.japantimes.co.jp/news/2016/03/11/national/not-japans-anti-nuclear-movement-fights-regain-momentum/>. Accessed on February 2, 2020.

67. Ibid.

**The Fukushima accident also revealed important realisations to both sides of the nuclear debate. To the ones supporting nuclear power, it exposed the dangers of nuclear technology and made clear that the slightest recklessness could lead to a big catastrophe, while, on the other hand, it invalidated the claims of anti-nuclear proponents, who exaggerated the effects of a nuclear accident.**

indicate the anti-nuclear mood in Japan, when it came to elections, citizens voted for Shinzo Abe as their new Prime Minister in 2012, despite his popular pro-nuclear stance. This raises questions whether the election represented a choice that the Japanese people had to make between immediate economic recovery over long-term safety concerns. It could, however, also be reflective of other factors such as leadership, management capabilities, etc.

Post-Fukushima, Japan faced a huge dilemma whether to do away with nuclear or not. They had no easy choices and were faced with complex trade-offs. While public sentiment was anti-nuclear, doing away with nuclear energy completely would pose severe challenges to their economy and

energy policies. The Japanese government eventually decided to continue to employ nuclear power in their energy basket, despite the anti-nuclear sentiment among the public. This, however, does not mean that public opinion was not considered by the Japanese authorities. The fact that all reactors are temporarily shut down since the Fukushima accident, and are being resumed only after clearing extremely stringent safety checks and regulations, demonstrates that the Japanese government has acknowledged the concerns of its citizens well, while taking pragmatic steps to protect the nation's economy.

### *Lessons from Fukushima*

As unfortunate as the Fukushima accident was, it did however provide adequate lessons to the world. It brought in the realisation that there is no space for even minor carelessness and laxity. It reset the safety norms followed by other countries. Immediately after Fukushima, all the

countries with civil nuclear capabilities reviewed their safety systems and re-examined their emergency preparedness plans. Some even halted their operations until their safety checks were tested and verified. In addition, it brought to light the importance of transparency by authorities to maintain credibility, and thus, by extension, to garner public support. The Fukushima accident also revealed important realisations to both sides of the nuclear debate. To the ones supporting nuclear power, it exposed the dangers of nuclear technology and made clear that the slightest recklessness could lead to a big catastrophe, while, on the other hand, it invalidated the claims of anti-nuclear proponents, who exaggerated the effects of a nuclear accident.

## CONCLUSION

The Japanese people are known to have a strong and indomitable spirit which they have demonstrated numerous times in the past. For example, within two decades of being attacked by nuclear bombs they were able to use the same technology to generate power and fuel their development. The Japanese government's decision to start the torch in Fukushima for the 2020 Olympics (since postponed by one year due to Covid-19) only goes to show the continuity of this spirit. It attempts to illustrate how the country has bounced right back within a decade of the unfortunate Fukushima accident. The Japanese government also deserves credit for acknowledging the mistakes and dealing with them transparently. The efforts made by the government after the Fukushima accident to increase safety measures and rebuild and reconstruct the damage have been commendable and beneficial to the nuclear industry worldwide.

The future of nuclear energy in Japan appears to be optimistic. The Japanese government recognises that doing away with nuclear energy is unrealistic. In this regard, Isshu Sugawara, member of the House of Representatives in the Diet and former Trade Minister, says that "There are risks and fears about nuclear power... But 'zero-nukes' is, at the moment and in the future, not realistic."<sup>68</sup> Currently, a

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68. n. 59.

**Completely phasing out nuclear energy is not a practical solution. This would not only lead to drastic increase in electricity prices, increasing burden on households by US\$ 10 billion (US\$ 115 per household), but would also lead to loss in jobs. The Institute of Energy Economics Japan (IEEJ) estimates that this would set an annual US\$ 11 billion decline in corporate tax revenue.**

new nuclear reactor is under construction in Japan and this indicates a sanguine future for nuclear energy in the country. Considering the absence of an alternate indigenous source of energy for Japan and the importance of nuclear energy for economic and environmental reasons, it would be difficult for Japan to do away with nuclear energy completely. Completely phasing out nuclear energy is not a practical solution. This would not only lead to drastic increase in electricity prices, increasing burden on households by US\$ 10 billion (US\$ 115 per household), but would also lead to loss in jobs. The Institute of Energy Economics Japan (IEEJ) estimates that this would set an annual US\$ 11 billion decline in corporate tax revenue.<sup>69</sup>

However, other factors could impact the nuclear discourse that Japan has embarked on. Political uncertainty and leadership is one such important factor that could determine the future of nuclear energy in Japan. If the Social Democratic Party of Japan comes to power in the next election—which is due to be conducted in 2021—and continues with its decision of phasing out nuclear power, it would completely change the nuclear discourse. In addition, Japan is mired in several complex challenges that it needs to deal with effectively. Garnering public support for one requires increased communication with the citizens. Nuclear issues are shrouded in confidentiality, thus the inscrutability and secrecy of the unknown tends to fuel fear. More transparency and information dissemination could go a long way in quelling the fears of the public and garnering support. It would do Japan well to revisit the principles of democratic methods, independent management and transparency upon which the Atomic Energy Basic Law was premised.

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69. n. 3.

Japan should also focus on other renewable sources of energy. A balanced, mixed energy basket of renewable sources would help Japan in achieving its climate change goals and power its economic development while minimising energy vulnerability.

Although it appears that the future of nuclear energy in Japan is positive, changing circumstances could change this trajectory. It would, however, be sardonic if the country that hosted the naissance of the world's first climate pact to reduce greenhouse gas emissions, the Kyoto Protocol, scales back on its most important source of achieving its green commitments.

# SPACE LAWFARE: A 'LEGAL' FIGHT FOR THE HEAVENS

MANU MIDHA

## INTRODUCTION

Rapid advancement in space technology and demonstrative application of space capabilities in almost all walks of life have led to space being recognised as a “strategic asset” by nations today. Space is not only an enabler and provider of warfighting capabilities but also plays a significant role in the economic development of a nation. Space capability is a prominent ‘force multiplier’ for militaries around the world and economic benefits of the potential of linking vast distances, gathering information, improving education and exploiting resources, amongst others, makes the ability to access and utilise space a priority for any nation.

The growing dependence of some advanced nations on space has also opened up the possibility of it being a ‘soft target’ for adversaries. While it is recognised that space has always been linked to other goals (usually related to foreign policy),<sup>1</sup> in contemporary environment it is considered as ‘congested, contested and competitive.’<sup>2</sup> Space is considered as the inevitable next domain of conflict and it can be expected that nations will

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1. Joan Johnson-Freese, *Space as a Strategic Asset* (New York: Columbia University Press, 2007), p. 7.
2. Joan Johnson-Freese, *Space Warfare in the 21st Century* (London: Routledge, 2017).



**Major spacefaring nations have over the years adopted a security driven and lately, a commercial approach to shape the international space regime rather than cooperative or symbiotic ones.**

employ all aspects of national power to secure an advantage.

For too long in our history we have considered war as an act of extreme violence unleashed by one State on another to force its will. However, it is well acknowledged that military is just one of the tools and one element of national power rather than the sole determinant of it. Today, nations adopt multifarious means to further their national interests in the competitive and contested world. It would not be incorrect to paraphrase

Clausewitz's classic dictum 'War is the continuation of politics by other means' to suggest that 'politics is a tool of war'. The behaviour of almost every nation during the recent Covid-19 pandemic outbreak of putting national interests first by closing its borders, prohibiting exports of medical equipment and deploying all means available to procure required equipment from other countries<sup>3</sup> is a stark reminder to the policymakers of the Hobbesian nature of international relations, notwithstanding the 'globalised complex interdependence' advocated by some commentators.

It is argued that space exploration and exploitation, ostensibly governed by a legal regime apparently based on principles of international cooperation and 'good of mankind' is, in effect, largely a by-product of attempts by major spacefaring nations to deny others any advantage which might be detrimental to own national interest and to ensure own unhindered and uncontested access to 'space resources'.<sup>4</sup> Major spacefaring nations have over the years adopted a security driven and lately, a commercial approach to

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3. Happymon Jacob points out that the first instinct of every major economy was to close borders, look inwards and localise. He mentions that in the EU the 'member states turned inwards for solutions: self-help, not regional coordination, was their first instinct'. Happymon Jacob, "COVID-19 and the crumbling world order", *The Hindu*, April 13, 2020.
  4. The geosynchronous orbital belt is considered the most lucrative space asset at this stage of technological development. With technological advancement, extraction and exploitation of resources from celestial bodies may open up significant possibilities.

shape the international space regime rather than cooperative or symbiotic ones.

This article argues that the development of international space regime was largely influenced by, and today is shaped by, realist considerations of achieving advantage over adversaries for national security and prioritising national interests over the often claimed considerations of international cooperation. It is important that national policymakers and practitioners responsible for safeguarding Indian space assets be cognizant of the tools of 'lawfare' used

by different nations in varying degrees to secure their interests in space without recourse to 'warfighting'. The article will briefly discuss the existing international space regime (hereafter referred to as regime) and then highlight the various considerations which informed its development and shape the regime as it stands today. The article highlights the predominantly 'realist' considerations that have shaped the regime and the ingenious interpretations of existing space laws by spacefaring nations which, it is argued, are against the spirit if not the letter of the regime. Some inferences and implications for India will also be discussed.

**It is important that national policymakers and practitioners responsible for safeguarding Indian space assets be cognizant of the tools of 'lawfare' used by different nations in varying degrees to secure their interests in space without recourse to 'warfighting'.**

## LAWFARE

The conceptual foundations of lawfare can be traced back to ancient times wherein Sun Tzu recognised that war and diplomacy 'comprise a continuous, seamless activity' and viewed diplomacy as the best means of attaining victory without bloodshed.<sup>5</sup> It has been argued that Hugo Grotius, the 'father of international law', may be considered as the first practitioner

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5. John W. Bellflower, "The Influence of Law on Command of Space", *The Air Force Law Review*, vol. 65 (2010), p. 110.

of lawfare for defending the concept of high seas.<sup>6</sup> In modern times the first reference of lawfare as a viable instrument of statecraft was recorded in a book, *Unrestricted Warfare*, written by two officers of People's Liberation Army of China in 1999.<sup>7</sup> The authors contend that war has undergone a metamorphosis wherein it is no longer simply "using armed forces to compel the enemy to submit to one's will, but rather... using all means, including armed forces or nonarmed force, military and non-military, and lethal and non-lethal means to compel the enemy to accept one's interest."<sup>8</sup> Built-in in the discourse was the concept of legal means to counter an adversary's strength. They defined 'legal warfare' as the "use of international law, and other means, to create a change in the strategic environment without the use of direct military action." Subsequently, US Air Force Major General Charles J. Dunlap Jr defined lawfare as "a method of warfare where law is used as a means of realizing a military objective."<sup>9</sup>

Fareed Zakaria contends that diversification and diffusion of power within the international system has led to an increased need for legitimacy in international conduct<sup>10</sup> and Kagan has remarked that "the struggle to define and obtain international legitimacy... may prove to be the most critical contests of our time."<sup>11</sup> Viewed in this light, achieving internationally recognised legitimacy for one's action has become the prerequisite for a successful national strategy. Logan defines lawfare as "the strategy of using or creating international or domestic law that result in a change in the strategic environment that is in the pursuit of a military or political objective."<sup>12</sup> As per Listner, employment of lawfare in outer space can be noticed even in the pre-Sputnik era, even though the term

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6. *Mare Liberum*, published in 1609; *ibid.*, p. 112.

7. Trevor Michael Alfred Logan, "International Law and the Use of Lawfare: An Argument for the US to Adopt a Lawfare Doctrine" (Graduate theses, Missouri State University, 2017), p. 4.

8. Bellflower, n. 5, p. 111.

9. Logan, n. 7, pp. 4-5.

10. Fareed Zakaria, "The Post-American World", pp. 4-5 quoted in Bellflower, n. 5, p. 110.

11. Robert Kagan, "America's Crisis of Legitimacy", *Foreign Affairs*, vol. 83, no. 2, March/April 2004, at 65 quoted in Bellflower, n. 5, p. 110.

12. Logan, n. 7, p. 5.

had not yet been defined, wherein the Soviet Union attempted to use customary law to claim sovereignty into space beyond the atmosphere. He argues that this tool of warfare, which uses 'clichés of cooperation and sustainability', is a ploy that employs the ambiguous nature of international law to create legal constraints to degrade an adversary's use of outer space. He asserts that lawfare in space has continued in the years since then and today manifests in the disarmament proposals for outer space.<sup>13</sup> It cannot be denied that attempts by major spacefaring nations towards proposals for disarmament of outer space are an acknowledged legal means aimed at limiting military advantage of the adversary and would justifiably fall under the rubric of space lawfare, hence this article will restrict the discussion of lawfare practised under the guise of international cooperation and legitimacy towards the development of the space legal regime and observed current practices of nations in space.

### **INTERNATIONAL SPACE REGIME**

The international space regime is primarily centred around five primary treaties.<sup>14</sup> However, there is much more to space law than these five core treaties. International space law is embedded in the bigger system of public international law and much of 'general international laws' apply to space or space activities. Various international laws like Law of Armed Conflict, Human Rights Law, environmental laws, UN Charter, Resolutions and Articles can all be considered to be part of the

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13. Michael Listner, "The art of lawfare and the real war in outer space." *The Space Review*, <https://www.thespacereview.com/article/3571/1>. Accessed on March 17, 20.

14. The five treaties are: (1) Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies; (2) Agreement on the Rescue of Astronauts, the Return of Astronauts and Return of Objects Launched into Outer Space; (3) Convention on International Liability for Damage caused by Space Objects; (4) Convention on Registration of Objects Launched into Outer Space; (5) Agreement Governing the Activities of States on the Moon and other Celestial Bodies.

Some commentators do not consider the fifth treaty, the Moon Agreement, as one of key constituents for the fact that it has been ratified by only 18 countries and none of them is a major spacefaring nation.

international space regime.<sup>15</sup> There is general consensus that the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,<sup>16</sup> is foundational in nature and character of international space legal regime as the rationale and contents of the four other space treaties are based on the provisions of OST<sup>17</sup> to the extent that some authors call the Treaty both the Constitution and Magna Carta of outer space.<sup>18</sup> This paper will, therefore, bring out the realist motives and considerations of spacefaring nations which guided the negotiations of OST.

### DEVELOPMENT OF SPACE REGIME

Walter McDougall has argued that national space programmes were born of four great inventions: radar, ballistic rocket, electronic computer and atomic bomb<sup>19</sup> and Dolman postulates that it was the perceived military necessity predicated on the growing power of a potential enemy that drove the development of space programmes.<sup>20</sup> There is widespread consensus in the published literature that the space programmes of almost all nations initially originated as military programmes with subsequent diversification into the civilian field.<sup>21</sup> Space was recognised as the 'ultimate high ground' and could provide any nation that dominated it with a crucial battlefield edge. The launch of Sputnik by Russia in October 1957 had a profound

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15. For a discussion on sources, formulation and constituents of international space law see Cassandra Steer, "Sources and law-making processes relating to space activities", in Ram S. Jakhu and Paul Stephen, eds., *Routledge Handbook of Space Law*, (Oxon: Routledge, 2017).

16. Hereafter referred to as Outer Space Treaty (OST).

17. Ram S. Jakhu, "Evolution of the Outer Space Treaty" in Ajay Lele, ed., *50 Years of the Outer Space Treaty* (New Delhi: IDSA, 2017), p. 13.

18. Joan Johnson-Freese, *Space as a Strategic Asset* (New York: Columbia University Press, 2007), p. 108. Although there are a few authors who do not agree with such an attribution.

19. Walter A. McDougall, ... *Heavens and the Earth: A Political History of Space Age* (New York: Basic Books, 1985), quoted in Everett Dolman, *Astropolitik: Classical Geopolitics in the Space Age* (London: Frank Cass Publishers, 2002), p. 89.

20. Everett Dolman, *Astropolitik*, n. 19, p. 91.

21. The Indian space programme is acknowledged as civil-led which made entry into military applications subsequently.

effect on the American public. Having been beaten by the Russians in launching a satellite was considered to be not only a reflection of the communist advancement in the scientific field but also a proof of the superiority of the communist military, cultural and political system. The aspect of a Russian satellite making a pass over the mainland United States four to six times in a day triggered US public insecurity that no one and nowhere was safe from nuclear devastation by the Russians. Having had the first mover's advantage, it appeared that the Russians were prepared to dominate the new domain.<sup>22</sup>

**United States found an answer to the Soviet threat in public efforts at cooperation while the scientists worked to catch up. With the potential of the new frontier to be the ultimate 'high ground', US foreign policymakers set out to convince or manipulate the Soviets into a public position of joint exploration of outer space.**

Dolman has argued that international cooperation in space evolved not due to noble ideas of synergy or benevolence but as an integral component of an overall strategy by spacefaring nations to ensure their political survival.<sup>23</sup> In line with the accepted military dictum to 'control' any factor which provides an advantage and deny the same to the adversary, the United States found an answer to the Soviet threat in public efforts at cooperation while the scientists worked to catch up. With the potential of the new frontier to be the ultimate 'high ground', US foreign policymakers set out to convince or manipulate the Soviets into a public position of joint exploration of outer space.

The approach was to offer space exploration as 'common heritage of all mankind' and to ensure that if outward cooperation was not feasible, military

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22. Although the USSR was the first to launch a satellite and the public perception in the West was shaped by politicians and media (*Life* magazine published articles like "Soviet Satellite sends US in a Tizzy"; "The Feat that Shook the World") as having been beaten in the race, there are counterviews that the Russians did not have the edge over the US as was brought out to be and it was politically and militarily prudent for the US not to bring out the deficiencies of the Soviet system. In fact, some accounts suggest that the US allowed Russia to be the first to launch a satellite as the event served the larger interests of the US. In either case, it is evident that the event was managed to further the national interests of the US.

23. Dolman, n. 19, p. 109.

neutrality was to be ensured. In the view of the US, a policy of outwardly global cooperation was to be followed to deny supremacy in space to any other nation.<sup>24</sup> Further, by the 1960s, the space power rivalry fuelled by the Superpower competition of the Cold War and the massive space build-up by President Kennedy had reached a point where it was felt that an international regime had to be enacted.<sup>25</sup>

### NEGOTIATIONS FOR OUTER SPACE TREATY

It can be argued that the negotiations for the Outer Space Treaty (OST) commenced as arms control negotiations which, after the rigours of realpolitik, ultimately culminated in the Treaty. At the peak of the Cold War, the US had the advantage of forward bases in Europe and other parts of the world where it based its strategic bombers and had the capability to target the Soviet Union. The Russians, on the other hand, did not have the advantage of forward bases and as such mainland US was insulated from attacks by the Russians. However, the launch of the space vehicle (Sputnik, in October 1957) demonstrated the capability of the Russians to manufacture ICBMs and target the US Mainland.<sup>26</sup> Against this background, President Eisenhower sent a proposal to the Soviet Union for banning of ICBMs in space. The proposal was the first veiled effort to neutralise Soviet ICBMs, and predictably, it was rejected by the Soviets who responded by linking it with US willingness to withdraw nuclear weapons from all foreign bases. The negotiations resulted in a proposal for United Nations to establish a programme to oversee international use of space<sup>27</sup> which then led to the formation of Ad Hoc Committee on the Peaceful Uses of Outer Space (AHCOPUOS)—the precursor of COPUOS. The Committee proposed some

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24. Dolman, n. 19, n. 19, pp. 94-96. The 'realist' approach to space of the US has been acknowledged by several authors. See below.

25. Dolman, n. 19, p. 109. Byers has argued that spacefaring states have a shared interest in avoiding the uncertainties and challenges that would result from absence of rules. See M. Byers, "Cold dark and dangerous: international cooperation in the arctic and space", *Polar Record* 55 (2019), p. 38.

26. *Life* magazine stated that "...the launching seemed to prove that Russia's intercontinental missile is a perfected machine...", Dolman, n. 19, p. 94.

27. Proposed by the Soviet Union on March 15, 1958.

basic principles which were unanimously approved as Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space in 1963 (the principles eventually became the basis for eight articles of OST). Subsequently in 1966, the US and the Soviet Union conveyed their desire to negotiate<sup>28</sup> a treaty which was accomplished on September 16, 1966. The Treaty was unanimously agreed to by UNGA on December 19, 1966 and entered into force on October 10, 1967.

It can be argued that the motives of the nations for negotiating a space regime attributed this approach to a fixed realpolitik perspective and discounted the possibility that the cooperation could have been motivated by a genuine desire of the nations to work harmoniously for the betterment of mankind. While it is not denied that countries of the world, especially the scientific community, have indeed cooperated and collaborated in diverse aspects of space exploration over the years, it is submitted that a discussion of politics of international cooperation in outer space *per se* is considered outside the purview of this paper.<sup>29</sup> With respect to the development of the space legal regime, it is important to remember the geopolitical context of the times when the regime was negotiated (1960s).<sup>30</sup> The world was at the peak of the

**To consider that the negotiations for norms to govern activities in a domain which presented the potential for unforeseen military advantages to any side to have been motivated by the larger good of mankind at the peak of Cold War—as opposed to realpolitik concerns—would be too optimistic an assessment of human benevolence.**

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28. President Johnson announced his desire to negotiate on May 7, 1966 and Soviet Ambassador Gromyko conveyed his willingness on May 30, 1966.

29. Although it can be argued that even the limited cooperation has also been to a large extent influenced by realpolitik motivations. For a discussion on the international politics of space development, the reader is referred to the Pulitzer awarded W. McDougall, ... *Heavens and the Earth* which is considered the best discourse on the subject.

30. Jakhu argues that the period between 1959 and 1963 was the most critical in the evolution of OST due to the geopolitical situation in the world—the height of Cold War. Although OST was finally signed in 1967, in 1963 the Declaration of Legal Principles was adopted which eventually formed the foundation of OST. Jakhu, n. 17, p. 15.



Cold War between the two blocs and had witnessed a major international crisis<sup>31</sup> involving deployment of missiles which is considered closest that mankind has come to a nuclear exchange till now. To consider that the negotiations for norms to govern activities in a domain which presented the potential for unforeseen military advantages to any side to have been motivated by the larger good of mankind at the peak of Cold War—as opposed to realpolitik concerns—would be too optimistic an assessment of human benevolence. Jakhu asserts that the geopolitical atmosphere at the beginning of the space age effectively determined the course of global space governance that ensued,<sup>32</sup> and as per Johnson-Freese, “a policy of strategic restraint, specifically restraint of military actions in space... had prevailed during the ‘space race’ years... These underlying premier strategic thoughts made possible the 1967 Outer Space Treaty.”<sup>33</sup>

Johnson-Freese asserts that space politics are affected by the larger geopolitics<sup>34</sup> and Johnson postulates that an adherent of theory of “realism” would agree that states participate in international cooperation only when it is in their own self-interest to participate in cooperation.<sup>35</sup> Havercroft and Duvall in their critique of Deudney’s “nascent theory of federal-republican international system that could limit conflict between space powers...” acknowledge that Deudney “ignores structurally asymmetric relations, in effect he ignores power.” They argue that Deudney fails “to acknowledge the profound asymmetries of aspirations and technological-financial-military capacities among states for control of orbital space.”<sup>36</sup> They also postulate that the realist version of astropolitics put forth by Dolman is “precisely the

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31. The Cuban Missile Crisis of 1962.

32. Jakhu, n. 17, p. 14.

33. Johnson-Freese, n. 1, p. 8.

34. *Ibid.*, p. 151.

35. Christopher Johnson, “Policy and Law Aspects of International Cooperation in Space”, American Institute of Aeronautics and Astronautics, Inc. (2011), p. 2.

36. J. Havercroft and R. D. Duvall, “Critical Astropolitics: The Geopolitics of Space Control and the Transformation of State Sovereignty: International Relations Theory and the Politics of” in N. Bormann and M. Sheehan, eds., *Securing Outer Space: International Relations Theory and the Politics of Space* (Routledge, 2009), pp. 49-50.

strategic vision underlying the policy pronouncements” of United States.<sup>37</sup> Johnson-Freese also acknowledges that “realism... has often prevailed as the view of nation-states that consider space as... ‘a vital national interest’” and further propounds that in outer space realist goals are best achieved by liberal-internationalist means (and includes legal means, such as OST, as one of them).<sup>38</sup> Thus, the underlying proposition of ‘legal means to support realist goals’ in space supports the argument of this paper, i.e., lawfare to achieve national objectives in space.

A significant aspect of the international space regime is the preference of the major space powers for consensus decision-making process and soft laws (rather than legally binding treaties). Contrary to what popular opinion might suggest that consensus decision making provides equal say to all members,<sup>39</sup> Byers argues that consensus decision making does not imply equality of power and influence but rather facilitates application of power. It provides a capacity to act as a spoiler in both theory and practice and hence makes it attractive for powerful states to protect their core interests. He argues that consensus decision making made it easier for the United States and Russia (the only space powers at the time) to achieve their desired outcomes, at least on issues of significant concern to them, while preserving the appearance of unanimity. Further, he argues that in a backdrop of rivalry and suspicion, soft law is preferred over legally binding treaties as states are able to pursue collective goals without making clear or firm commitments to others that they distrust and avoid mandatory commitments. It also helps that soft laws reduce the stakes and can be kept within the ambit of the experts for consensus decision making.<sup>40</sup>

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37. *Ibid.*, p. 47.

38. Joan Johnson-Freese, “Outer Space Treaty and International Relations Theory: For the Benefit of All Mankind”, in Ajey Lele, ed., *50 Years of the Outer Space Treaty* (New Delhi: Pentagon Press), pp. 21-23.

39. Jakhu argues that to ensure that views and perspectives of all Committee members were heard and respected, it was decided that decisions by COPUOS will be made by consensus. Jakhu, n. 17, p. 16.

40. Byers, n. 25, pp. 39-40.

### **THE OUTER SPACE TREATY**

Spacefaring nations recognised many requirements from outer space. These included monitoring the activities of the adversaries (at the peak of the Cold War); denying the adversary any perceived military advantage (of 'ultimate high ground'); safeguarding the (as yet undetermined) commercial value of outer space; and standardising the expected future behaviour in space while at the same time couching the objectives in morally acceptable terminology of international cooperation and larger 'good of mankind' ... It would be instructive to assess the approach and motivations of the major powers towards negotiations for various aspects of the Treaty.

### **RIGHT OF INNOCENT PASSAGE**

At the time the major concern for United States was development of Soviet capability to target mainland US. It was US' objective to monitor and, if possible, impede the Soviet advances in development of ICBMs. Indeed, as was brought out earlier, the initiation of the negotiations for the outer space treaty was guided by US attempts to restrict Soviet ICBM development. The requirement to monitor Soviet activities in the field had also prompted President Eisenhower earlier to propose an 'open skies' policy to the Soviets in which International Air law was to be modified to permit 'innocent passage' of reconnaissance aircraft to gather information.<sup>41</sup> In order to pursue its larger interests, the US was keen on following the precedent of International Sea Law rather than the Air Law which would have restricted the right of overflight. It is argued that the dilemma for the US was solved by the Soviets 'winning' the space race by launching Sputnik first. Having first launched the satellite overflying other countries the Soviets were in no position to object to the principle of 'right of overflight' in space for other countries.<sup>42</sup> As McDougall comments, "having argued necessarily for the

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41. The fact that the US continued to overfly the Soviet Union in disregard of the international law is moot. There were some attempts by the US to justify such flights on the basis of 'effective control definition' also till Gary Powers was shot down in 1960. See Dolman, n. 19, p. 118.

42. Some commentators attribute this concession gained as one of the reasons for the US to let the Soviets launch a satellite first.

legality of their satellite, the Soviets had to deal with the hidden American agenda, the use of satellites for espionage and military support.”<sup>43</sup> The principle of unimpeded overflight in space established by the launch of the Sputnik in 1957 remains intact till date.

It is also worthwhile to note that with the option of accepting precedent of either the International Law of Sea or the Air Law available to the negotiators at the time, the choice was made for unimpeded right of overflight based on International Law of the Sea, whereas a precedent of Air Law which could have led to legally prohibiting carriage and photography by satellites signifies the importance attached to the requirement of monitoring the territory of adversaries<sup>44</sup> by the two antagonists.

#### **VERTICAL SOVEREIGNTY**

The motivations for defining the vertical limits of air and space were closely linked to the motive for right of unimpeded overflight as brought out above (although it was not the only consideration). The International Air Law asserts that “every state has complete and exclusive sovereignty over the air space above its territory.”<sup>45</sup> An agreement by the contracting parties to extend the sovereignty of states on the Air Law precedent and on the basis of the legal custom of *cuius est solum, eius est usque ad coelum et ad inferos* (“Who owns the land owns it up to the sky”)<sup>46</sup> would have extended the sovereign rights of nation-states to the outer space and hence denied the spacefaring nations with the right of unimpeded overflight.

The extension of unrestricted vertical sovereignty into outer space would also have resulted in sovereign claims over the limited geosynchronous orbital slots by the equatorial nations. As Johnson-Freese brings out, the most precious and limited commodity in outer space at this stage of technological

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43. McDougall, *Heavens and the Earth*, p. 120 quoted in Dolman, n. 19, p. 108.

44. Innocent passage in the oceans allows for photographic and other reconnaissance activities in certain instances whereas as per Air Law, States “may prohibit or regulate the use of photographic apparatus in aircraft above its territory.” Dolman, n. 19, pp. 119-20.

45. Convention on International Civil Aviation.

46. Dolman, n. 19, p. 117.

**One of the primary considerations of space powers was to regulate the use of space for military purposes. The major obstacle to be negotiated was the definition of what constitutes 'peaceful use' of outer space. The United States was of the opinion that the difference should be between 'peaceful' and 'aggressive' use whereas the Soviets contended that the differentiation should be military (legitimate) or non-military (legitimate) use of space.**

development appears to be the availability of geosynchronous orbital slots.<sup>47</sup> Denial of the freedom to occupy desired orbital slots or transverse the orbital space would have resulted in ceding the militarily advantageous 'high ground' and denied commercial benefits, and hence was not acceptable to the major powers. It could be argued that at that stage of space technology development, the benefits likely to accrue from geosynchronous orbits as being exploited today may not have been evident and attributing motives now amounts to selective application of hindsight. It is submitted that the benefits from space capabilities were widely predicted by science fiction writers a generation in advance and it is unlikely that the scientific community of

the time would have been unaware of its potential, even though the technical capabilities may not have existed at the time. Nevertheless, the importance of the orbital real estate was realised by equatorial nations and sovereignty over them was claimed by them in the Bogota Declaration.<sup>48</sup> Needless to say, the Declaration by largely underdeveloped countries was dismissed by the major space powers.

Coupled with the realist concerns of reconnaissance and commercial exploitation which accrue to space powers, another impediment in defining the limits of vertical sovereignty is the difficulty in delimiting the air-space

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47. Johnson-Freese, *Space Warfare*, n. 2, p. 131. Also Dolman, n. 19, p. 64.

48. In December 1976, the equatorial states of Brazil, Columbia, Ecuador, Indonesia, Kenya, Uganda and Zaire declared that their national sovereignty extended to the geostationary belt, 22,000 miles above the equator.

boundary. There have been numerous attempts at defining the limits of air by international organisations; however, till now there is no consensus on the aspect.<sup>49</sup> As there was no scientific clarity to the benefits that may accrue to certain States from a particular definition, it is unsurprising to note that “at the time of Outer Space Treaty negotiations, a definition of what constitutes outer space was not discussed.”<sup>50</sup> Absence of clarity on benefits of any particular delimitation appears to be the motive and intent of spacefaring nations even today. The lack of interest on the part of nations to resolve the aspect is in part guided by the fact that the current regime does not impede any perceived utilisation of space by the major nations as desired.<sup>51</sup>

**Article IV of OST limits military use of outer space by prohibiting the placement of nuclear weapons and weapons of mass destruction in orbit around the Earth and establishment of military bases and testing of weapons on celestial bodies.**

#### USE OF OUTER SPACE FOR MILITARY PURPOSES

One of the primary considerations of space powers was to regulate the use of space for military purposes. The major obstacle to be negotiated was the definition of what constitutes ‘peaceful use’ of outer space. The United States was of the opinion that the difference should be between ‘peaceful’ and ‘aggressive’ use whereas the Soviets contended that the differentiation should be military (legitimate) or non-military (legitimate) use of space. The Soviet argument was based on the pretext that nearly every military application could be justified as defensive and hence, ‘peaceful’ in nature. In the end, the final text of the Treaty is considered to be more a reflection

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49. A number of attempts have been made to define where air space ends and outer space begins since the launch of Sputnik-I. The issue has been on agenda of UNCOPUOS since 1959. For a brief expose on the attempts, approaches and difficulties to delimit the air-space boundary, see Stephan Hobe and Kuan-Wei Chen, “Legal Status of Outer Space and Celestial Bodies”, in Ram S. Jakhu and Paul Stephen, eds., *Routledge Handbook of Space Law* (Oxon: Routledge, 2017), p. 28.

50. Dolman, n. 19, p. 114.

51. No country has as yet objected to a space object overflying (during launch or re-entry) its sovereign air space. Although there has been one known protest—Japan against North Korea in 2012. Hobe and Chen, “Legal Status of Outer Space and Celestial Bodies”, n. 49, p. 28.

of the Soviet viewpoint rather than the American. Article IV of OST limits military use of outer space by prohibiting the placement of nuclear weapons and weapons of mass destruction in orbit around the Earth and establishment of military bases and testing of weapons on celestial bodies.<sup>52</sup> It says that States are obliged to use celestial bodies 'exclusively for peaceful purposes' and that outer space needs only to be explored and used for 'peaceful purposes'. It has been argued that use of the word 'exclusive' for peaceful use of celestial bodies and excluding the same for outer space implied that certain military activities in outer space were legitimate if exercised lawfully.<sup>53</sup> Notwithstanding the text of the treaty or the apparent acceptance of the same by the US, the interpretation of the 'peaceful use' by United States does not appear to have changed and is still interpreted as 'defensive' and permissive of military use, as will be discussed later. At this stage, it is sufficient to recognise that the powers consented to consider military activity in space legitimate if undertaken 'lawfully' and not prohibit placement of general weapons in space (it prohibits placement of weapons on celestial bodies and only WMDs in space). Whether the same was the desired objective or a clever interpretation is moot and in either case supports the basic argument of use of law to achieve national objectives.

Further, Poulsen contends that stationing of military forces in outer space was not forbidden, as both the Soviet Union and United States wanted to prevent a debate on the military satellites they both had circling the globe. Seen in this light, it is evident that the Treaty aimed to keep the window of 'legitimacy' of military use of space open for the two space powers and at the same time restrict the military advantage that may accrue from space capability.

## COMMERCIAL EXPLOITATION

One of the major considerations of the contracting states was to lay the framework for defining the legal status of the resources that were or likely to be available for exploitation in space. With the desired norm that sovereignty of a state did

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52. OST, Article IV.

53. Hobe and Chen, "Legal Status of Outer Space and Celestial Bodies", n. 49, p. 34.

not extend indefinitely vertically into space, and hence by corollary that space was for use by all 'mankind', there was a requirement to establish norms for the exploitation of space resources. Historically, the notion of 'common goods' as are understood date back to the Roman times with the concepts of *res communis* ('thing for everyone') and *res nullius* ('thing for no one'). There are divergent views amongst scholars on the applicability of the two concepts for outer space. What is important is that the definition proposed by the US was more attuned to the concept of *res communis* and it was expected that the 'communal' definition would be more acceptable to the Soviet Union. However, it was opposed by the Soviet traditionalists as being a product of capitalism which justified 'the rule of the exploiting classes'. Nevertheless, the definition as proposed by the US was finally accepted by the Soviets since it served Soviet national interests better, even though it ran counter to their ideological beliefs. The Soviet Union was the first nation to launch a space object and believed had the infrastructure to exploit the advantage. The definition as proposed could position the Soviet Union in an advantageous position as compared to any other nation and hence was acceptable. At the same time, it was the known Soviet intent that future negotiations would be directed at changing the meaning of the term to make it consistent with contemporary socialist theory—the aim to convert from 'no-public-sovereignty' to 'no-private-property'. The Soviets wanted to deny space exploration to private enterprises—something that would have given the West a definite edge.<sup>54</sup>

The other concern was expressed by non-spacefaring nations who argued that as all states collectively owned space, all should equally benefit from the fruits of the exploitation.<sup>55</sup> Towards that a principle of 'non-appropriation' of space resources was incorporated in OST according to which no State could claim sovereignty over any celestial body.<sup>56</sup> Article I of OST also stated that all countries should share the benefits of space 'irrespective of their degree of economic or scientific development'. It can be said that experience over

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54. Dolman, n. 19, pp. 97-100.

55. *Ibid.*, p. 100.

56. For a discussion of the principle, see Hobe and Chen, "Legal Status of Outer Space and Celestial Bodies", n. 49, p. 29.



the years does not suggest that the benefits of space exploration have been distributed equitably amongst all nations as even though the Treaty gives all states the freedom to explore and use outer space, not all states have the economic and technological capabilities to profit from space activities.<sup>57</sup> Perhaps the limitation was instrumental for the Third World countries to insist on inclusion of 'equitable' sharing of benefits among all nations of the Earth in the Moon Agreement. It is no surprise that the Moon Agreement has not been ratified by any major spacefaring nation.<sup>58</sup> As brought out earlier, the attempt by Third World equatorial countries to benefit from commercial exploitation of the limited geosynchronous slots was also not ceded by the major spacefaring nations.<sup>59</sup>

### **REGISTRATION OF SPACE OBJECTS**

The requirements for registration of objects in space<sup>60</sup> are much more stringent than those for sea and air. The strict requirements have been justified on the grounds of the larger potential for global physical or environmental damage as also the specific peculiarities of establishing accountability between the launching and controlling state. However, it is instructive to note that while referring to the ratification of the OST, US Ambassador Arthur Goldberg stated that "This is a matter of national security. We believe that when there is registration of launchings this gives us an opportunity to, and the world community to, check up on whether the launchings are, indeed, peaceful or whether they are for some other purposes."<sup>61</sup> Once again it can be seen that the motives for the requirement were primarily military but couched in terms of rule-based regime to gain legitimacy for keeping a check on the adversary's activities in space.

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57. Hobe and Chen, "Legal Status of Outer Space and Celestial Bodies", n. 49, p. 35.

58. The agreement has been ratified by only 18 countries.

59. Refer to the Bogota Declaration.

60. Article VIII of OST mentions the requirement of 'registry' of objects launched into space. The modalities were further clarified in the Convention on Registration of Objects Launched into Outer Space.

61. Dolman, n. 19, p. 119.

## PRINCIPLE OF COOPERATION

It has been argued earlier in the paper that negotiations for the OST were guided by the self-serving motives and national interests of spacefaring nations rather than for promoting international cooperation. References to cooperation can be found in Articles III, IX and X of OST. Article X was a Soviet proposal which stated that States that allow another State to use its earth observation facilities to track satellites should also allow all other States to do the same. This seemingly cooperative approach to facilitate space activity was guided by the fact that while US had territories and allies in all four hemispheres, the Soviet bloc was mostly located in central Eurasia, giving the US a clear advantage in space affairs.<sup>62</sup> Further, as Hobe and Chen bring out, space law does not provide a definition of the exact scope and meaning of the cooperation principle. The principle is formulated in OST in a broad sense that States shall be 'guided by' cooperation and mutual assistance and shall carry out space activities with due regard to activities of other States. It further only 'calls upon' States to carry out activities in outer space in accordance with international law "in the interest of maintaining international peace and security and promoting international cooperation and understanding." They argue that OST (and the Moon Agreement) is broad in this respect and does not provide procedural mechanism to facilitate cooperation. The Treaty does not specify requirements or guide to States as to how they can exercise their activities in a manner that would ensure that the standard of care towards activities of other states is 'enough'<sup>63</sup> and neither does it establish any central authority to direct and oversee acts of cooperation—it is left to the States how much cooperation, as envisaged in the treatise, is implemented. And while they acknowledge that attempts to clarify the duty to cooperate under Article I of OST did not bear fruit,<sup>64</sup> it would not be incorrect to assume that the same was intentionally left ambiguous to prevent any firm commitment

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62. Jesper Poulssen, "Rivals and Cooperation in Outer Space" (Master Thesis, 2016), pp. 9-10.

63. Hobe and Chen, "Legal Status of Outer Space and Celestial Bodies", n. 49, p. 36.

64. Ibid.

**Spacefaring nations including France, Japan and India do not pose a credible challenge to US supremacy in space and the space race between erstwhile Soviet Union and US has now been replaced by a contest between China and the US.**

from spacefaring nations towards non-spacefaring nations and was the grand bargain<sup>65</sup> of the 'haves' with the 'have-nots'.

In the end, it can be seen that the motivations for the two space powers at the time of negotiating OST were largely guided by the realist approach to safeguard and pursue their individual national interests legitimately in the domain which had potential to offer tremendous advantages both in military and commercial terms. The spacefaring nations were able to establish the foundation for an

international regime that ensured none of them could obtain an unanticipated advantage in space domination.<sup>66</sup>

### **OBSERVED PRACTICE**

Having established that the development of the international space regime was predicated on the desire of the space Superpowers to safeguard their national interests, it would be instructive to examine practice and approach of major spacefaring nations towards the basic principles of the space regime in contemporary environment. Today, access to and unrestricted use of space is considered a 'vital national interest' by the US,<sup>67</sup> a revitalised national interest by Russia and an aspiring national interest by China, India and many other countries.<sup>68</sup> Russia, although still a prominent player in space, is a shadow of the erstwhile Soviet Union at least with respect to the

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65. Jakhu asserts that the maintenance of "fair balance between the interests and obligations of all concerned" is the fundamental requisite for success of OST and the global space governance it initiated. Jakhu, n. 17, p. 18.

66. Dolman, n. 19, p. 87.

67. "United States considers unfettered access to and freedom to operate in space to be a vital interest". 2017 US National Security Strategy, quoted in John Klein, *Understanding Space Strategy* (New York: Routledge, 2019), p. 101. Johnson-Freese also contends that the US is working for 'space supremacy' where no other nation can challenge it in space.

68. Johnson-Freese, n. 38, p. 20.

capacity to put in space effort relative to the US. Other spacefaring nations including France, Japan and India do not pose a credible challenge to US supremacy in space and the space race between erstwhile Soviet Union and US has now been replaced by a contest between China and the US. Today, the US is the undisputed leader in space capability with 2,382 out of a total of 5,799 space objects currently in orbit<sup>69</sup> and, as a consequence, gets to set the agenda for determining the space regime. Johnson-Freese argues that geopolitics affects national interpretations of OST<sup>70</sup> and that “by virtue of its size and scope, the efforts of US space policy spill over to the rest of the world.”<sup>71</sup>

Indeed, Bellflower argues that “America’s extensive use of space ... should translate to significant power to guide and shape international law regarding space”<sup>72</sup> and that it “must actively engage the international legal process in an effort to mould law in such a way as to enhance national security interests.”<sup>73</sup> It is considered that the approach of the US, as exemplified by formulation of its domestic space laws and policies and her views on furtherance of international space regime, would not only be a reflection on the use of law(fare) by the US to achieve national objectives in space but also inform the actions of other spacefaring nations. The same is discussed in brief next.

### **‘PEACEFUL USE’ OF OUTER SPACE**

Article IV of the Outer Space Treaty mentions that “... The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes.”<sup>74</sup> As discussed earlier, during the negotiations for the treaty there were conflicting interpretations put forward for ‘peaceful purposes’; however, the phrase itself was not defined in the Treaty. Although the understanding, as put by the Soviets, of ‘peaceful purposes’, implying

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69. UNOOSA. [www.unoosa.org/oosa/osoindex/seach-ng.jsp](http://www.unoosa.org/oosa/osoindex/seach-ng.jsp). Accessed on April 9, 2020.

70. Johnson-Freese, n. 38, p. 20.

71. Johnson-Freese, n. 2, p. 158.

72. Bellflower, n. 5, p. 109.

73. *Ibid.*, p. 116.

74. OST, Article IV.

**From the Kennedy administration until Reagan administration, non-aggressive meant 'passive systems' only and used for force enhancement. In its zeal to pursue SDI, the Reagan administration redefined 'peaceful purposes' as 'defensive'.**

non-military, was understood to have been accepted, till today there is a considerable debate whether 'peaceful purpose' signifies 'non-military' or 'non-aggressive or non-hostile'.<sup>75</sup> While some countries believe that 'peaceful purposes' precludes any military activity in space,<sup>76</sup> the US has maintained the view that 'peaceful purposes' means 'non-aggressive' which is again open to interpretation. From the Kennedy administration until Reagan administration, non-aggressive meant 'passive systems' only and used for force enhancement. In its zeal

to pursue SDI, the Reagan administration redefined 'peaceful purposes' as 'defensive'.<sup>77</sup> The US military in itself has always supported the more liberal interpretation as meaning non-aggressive and not restricted to passive systems. Since then, US policy has repeatedly stated that 'peaceful purposes' within OST means non-aggressive and allows for space to be used for national and homeland security activities. The US interpretation means that space-based systems may be legally used for functions that facilitate military activities.<sup>78</sup>

It can be argued that it was the intent of nations to ensure that man does not extend his fights of earth on to the 'Heavens', which prompted the state parties to include 'exclusively for peaceful purposes' in the Treaty.<sup>79</sup> By

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75. Michael N. Schmitt, *International Law and Military Operations in Space*, 10 UNYB 89, 101(2006) quoted in Bellflower, n. 5, p. 128; "The United Space Force," Space Legal Issues, <https://www.spacelegalissues.com/space-law-the-united-states-space-force/>. Accessed on April 14, 2020; Klein, *Understanding Space Strategy*, n. 67, pp. 50, 101; Johnson-Freese, *Space as a Strategic Asset*, p. 108.

76. Klein, *Understanding Space Strategy*, n. 67, p. 101.

77. Johnson-Freese, n. 2, p. 108.

78. Klein, *Understanding Space Strategy*, n. 67, p. 101.

79. UNGA resolution of December 13, 1958 stated that it wished to avoid the extension of present national rivalries into the field of outer space.

using the interpretation of ‘peaceful’ implying ‘non-aggressive’<sup>80</sup> and hence gaining legitimacy to use of space for military purposes, the United States believes that the treaty does not hinder protection of its national interest in space and is one of the factors for US reluctance to negotiate a new legal regime for space.<sup>81</sup>

### **WEAPONISATION OF SPACE**

The official US view on the weaponisation of space assumes that conflict in space is inevitable<sup>82</sup> and the US Doctrine Document enjoins upon US Air Force to execute “the counter space function to protect US military and friendly space capability while denying space capability to the adversary, as the situation requires.”<sup>83</sup> It is widely acknowledged that ‘denying space capability to an adversary’ would necessitate use of force and the same is opined to be ‘legal’ in the understanding of the USAF. One of the arguments presented is that the legality of any action depends upon the actor’s intent and not with the capability itself, and as the intent of the US is ‘self-defence’ to maintain its “legal right to continued and assured access to space” the same is permissible under international law. It is also argued that OST does not prohibit self-defence in outer space via non-nuclear weapons and non-weapons of mass destruction.<sup>84</sup> In a similar manner it is argued that Anti-Satellite Weapons are not legally prohibited under Article IV of OST as they are not weapons of mass destruction.<sup>85</sup> USAF doctrine also clearly announces that “the right of self-defence, as recognised in... international law, applies to outer space.”<sup>86</sup> Public statements by US military leadership,

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80. Bellflower, n. 5, p. 128; “The United Space Force,” Space Legal Issues.

81. Klein, *Understanding Space Strategy*, n. 67, p. 101.

82. The Rumsfeld Commission report stated “we know from history that every medium—air, land and sea—has seen conflict. Reality indicates that space will be no different.” Quoted in Johnson-Freese, n. 2, p. 58. Also, “according to Pentagon, the only thing inevitable about space is that it will be a battlefield.” *Ibid.*, p. 165.

83. US Air Force Counterspace Operations, AFDD 2-2.1, p. 1.

84. For a description of the argument presented, see Bellflower, n. 5, p. 129.

85. “The United Space Force”, Space Legal Issues.

86. Bellflower, n. 5, p. 128.

including (then) US Strategic Command Commander Gen John Hyten, also supports the position that the US believes the right of self-defence applies in space.<sup>87</sup> It is significant that the doctrine accepts “precepts such as necessity, distinction and proportionality will apply to any military activity in outer space.” This clearly signifies that the US does contemplate use of force as a viable ‘legitimate legal’ option, and hence the weaponisation of space. Since then the US has also established a ‘Space Force’. The Space Policy Directive-4 states that “it is imperative that the United States adapt its organizations, policies, doctrine, and capabilities to deter aggression and protect its interests,” and one of the tasks of the Space Force is “to defend satellites from attack.”<sup>88</sup> The US also continues to perceive proposals for Prevention of an Arms Race in Outer Space (PAROS) treaty as lawfare by Russia and China against it.<sup>89</sup>

### COMMERCIAL EXPLOITATION OF CELESTIAL BODIES

Since time immemorial, the desire for greater economic power has been considered a national interest which needed to be protected and advanced. The commercial interests of a nation have influenced the character of warfare and it can be safely assumed that commercial considerations in space will influence national strategies in space<sup>90</sup> as well. It is important to note that while negotiating the OST, the parties had agreed to incorporate a ‘non-appropriation principle’<sup>91</sup> wherein States were prohibited to declare sovereignty or territorial claims over outer space and on celestial bodies. Article II of OST states that

Outer space including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or by other means.

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87. US Strategic Command Commander Gen John Heyten quoted in Klein, n. 67, p. 77.

88. “The United Space Force,” Space Legal Issues.

89. Listner, “The art of lawfare”, n. 13; Bellflower, n. 5, p. 133.

90. Klein, n. 67, p. 178.

91. Hobe and Chen, n. 49, p. 29.

The non-appropriation principle is also enshrined in the Moon Agreement which states that "... The Moon is not subject to national appropriation by any claims of sovereignty, by means of use of occupation or by any other means."<sup>92</sup> However, in December 2015, the US adopted a domestic legislation<sup>93</sup> which guaranteed private actors rights in an "asteroid resource or space resource obtained, including the right 'to possess, own, transport, use, and sell the asteroid resource or space resource."<sup>94</sup> The US Act recognised the rights of US citizens to own the resources they obtain through the mining of asteroids.<sup>95</sup> There has been considerable debate on whether the Act was in consonance with the internationally recognised principles and it is considered by some that endowing private actors with rights goes above and beyond the original purpose and interest of OST.<sup>96</sup> It is argued that it is "not possible for a State to legislate such that it allows commercial entities to claim property rights over celestial bodies, given that Outer Space Treaty prohibits this."<sup>97</sup> The passage of the Act by the US Congress was also denounced by the Russians as an egregious breach of the OST.<sup>98</sup> Notwithstanding international opinion, the US considers the Act to be in compliance with OST and the same is explained in the Act as "it is the sense of Congress that by enactment of this Act, the United States does not thereby assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body."<sup>99</sup> And while doing so the US Congress seemed to disassociate itself from the statement of the US delegate for the negotiations of OST who had stated that "... the provision prohibiting national appropriation ... was a strong safeguard for those States which at present had no space programme of their own."<sup>100</sup>

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92. Article 11 of Moon Agreement.

93. US Commercial Space Launch Competitiveness Act 2015.

94. Hobe and Chen, n. 49, p. 30.

95. Johnson-Freese, n. 2.

96. Hobe and Chen, n. 49, p. 37.

97. Steer, n. 15, p. 13.

98. Johnson-Freese, n. 2, p. 154.

99. Klein, n. 67, p. 202.

100. Jakhu, n. 17, p. 18.



**The 2011 NASA budget explicitly forbade it to use any funding to cooperate with China or Chinese companies or to host Chinese scientists in any of their buildings.**

Perhaps recognising that the Act was unable to further the US commercial interests as desired, the US further promulgated an Executive Order on April 6, 2020 that clarifies the US position that she “does not view it (Outer Space) as a global commons” and “...it shall be policy of the United States to encourage international support for public and private recovery and use of resources in outer space...” The Order further mentions that “United States does not consider the Moon

Agreement to be an effective or necessary instrument to guide nation-states regarding the promotion of commercial participation....”<sup>101</sup> While on the one hand the Order makes clear that the US recognises OST but supports exploitation of space resources,<sup>102</sup> on the other it also demonstrates that the US considers domestic legislation and its interpretation of international treaties to support its commercial interests as legitimate. The US stand on the aspect is clear vindication of use (and interpretation) of law to further its interests in space. The position of US (and other States) with respect to the claims of equatorial nations over geosynchronous orbital slots has already been referred to earlier.

## **COOPERATION WITH CHINA**

While the initial history of the space age was characterised by a fierce competition between the US and erstwhile Soviet Union, the current environment is one of rivalry between the US and China. It has been US' aim to obstruct the rise of China as a major space power and paradoxically,

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101. United States White House, *Executive Order on Encouraging International Support for the Recovery and Use of Space Resources*. <https://www.whitehouse.gov/presidential-actions/executive-order-encouraging-international-support-recovery-use-space-resources/>. Accessed on April 7, 2020.

102. Marcia Smith, “New Executive Order Calls for International Agreements for Space Resource Rights, But no New Treaty.” *Spacepolicyonline.com*, <https://spacepolicyonline.com/news/new-executive-order-calls-for-international-agreements-for-space-resource-rights-but-no-new-treaty/>. Accessed on April 10, 2020. It can be argued that US recognition of OST is a result of its reluctance to negotiate any new treaty (see below).

Russia and the US seem to have found common interest in that aim. Byers argues that Russia and the US are resisting greater Chinese involvement in outer space and greater reliance on the part of the two countries on soft law in space could be in part due to their efforts to slow down China's rise as a space power. According to Byers, the US and Russia have also not shown much interest, or effort, to pursue any new multilateral treaty on space as it would recognise and involve China as a major space power.<sup>103</sup> Domestically, the US has used legislation to curtail any international space cooperation which might not be beneficial to the US and especially with China. NASA policy directive states that:

"Each cooperative activity must demonstrate a specific benefit to NASA... or it may directly support broader US policy or interests."<sup>104</sup>

The 2011 NASA budget explicitly forbade it to use any funding to cooperate with China or Chinese companies or to host Chinese scientists in any of their buildings. International Space Station, which is considered to be an example of exemplary space cooperation,<sup>105</sup> does not have Chinese participation because US Congress banned NASA from working with Chinese National Space Agency in 2011<sup>106</sup> and for the same reason China is not part of NASA's proposed Lunar Gateway, while paradoxically Russia is an ally in this endeavour.<sup>107</sup> Incidentally, the Executive Order referred to in the previous section calls upon "international support for... use of resources in outer space...." It is argued that the same is motivated by the fact that in the near future no other nation except China can be expected to reach technical maturity to attempt such an endeavour. By welcoming international (Chinese) cooperation, US aims to pre-empt any opposition to the endeavour.

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103.Byers, n. 25, 41.

104.NASA Policy directive 1360 2B, <http://nodis3.gsfc.nasa.gov/>.

105.Johnson, n. 35, p. 6.

106.Byers, n. 25, p. 42; Poulssen, n. 62, p. 2.

107.Ibid.

**The current international space regime, for its lack of any enforcement or regulatory mechanism serves larger national interests and hence is unlikely that the US would be willing to develop a more regulatory framework in the future.**

#### **FORMULATION OF NEW SPACE REGIME**

The US considers the right of passage and access to outer space without interference as an inalienable right and that it will “preserve its rights, capabilities, and freedom of action in space.”<sup>108</sup> The US has been against “the development of new legal regimes or other restrictions that seek to prohibit or limit US access to or use of space”<sup>109</sup> and, as Smith puts it, the “Executive Order (of April 6, 2020) formalizes it.”<sup>110</sup> With respect to exploitation of resources, Hitchens says that “US is just adamant and focused about it being the State

which establishes precedence on the use of space resources, rather than have a long and uncertain process within COPUOS ... develop rules.”<sup>111</sup> The current international space regime, for its lack of any enforcement or regulatory mechanism serves larger national interests<sup>112</sup> and hence is unlikely that the US would be willing to develop a more regulatory framework in the future.<sup>113</sup> Klein also argues that the US believes its interpretation of ‘peaceful purposes’ within the OST does not hinder protection of its national interests in space and hence, does not seek development of a new legal regime.<sup>114</sup> Incidentally, the US is also amongst the countries where

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108. Bellflower, n. 5, p. 125.

109. Ibid.

110. Marcia Smith, “New Executive Order Calls for International Agreements for Space Resource Rights, But no New Treaty.” Spacepolicyonline.com.

111. Theresa Hitchens, “WH woos Potential Allies, Including China, for Space Mining.” *Breaking Defense*, <https://breakingdefense.com/2020/04/wh-woos-potential-allies-including-china-for-space-mining/>. Accessed on April 9, 2020.

112. Johnson, n. 35, p. 6.

113. Hitchens also asserts that “it is consistent with the administration’s long-standing reluctance to empower multinational bodies ... to set legally binding rules for space.” Hitchens, “WH woos Potential Allies”.

114. Klein, *Understanding Space Strategy*, n. 67, p. 101.

compliance for registration of space assets is less than complete<sup>115</sup> which can be considered as a reflection of its intent to utilise the current framework to its advantage.<sup>116</sup>

It can be seen that the US has been fairly successful in developing legal positions to achieve its national objectives in space, namely, continued hegemony in space, impeding the growth of Chinese space capabilities and commercial exploitation of resources on celestial bodies, at the same time building a framework to gain 'legitimacy' for placement and use of weapons in outer space in future, should it be required. Seen in light of the definition of lawfare discussed earlier it can be justifiably concluded that the US is employing law(fare) to achieve its national space objectives. It is not to suggest that other spacefaring nations can be absolved of the equivalent charge. Indeed, the US has maintained that Russia and China are engaged in lawfare to impede US development of space capabilities. However, a discussion of employment of lawfare by other nations is not feasible in this paper due limitations of space. Being the predominant space nation, actions by the US are likely to set precedents and inform future behaviours of other nations. From the preceding discussion, it can be surmised that the use of lawfare to further national objectives in space has been an established practice and is likely to be so in the future.

### **IMPLICATIONS FOR INDIA**

The foundations for the Indian space programme were rooted in civilian purposes, however, over a period of time she has taken steps towards military utilisation of space assets. India has made steady progress in utilising space for weather, reconnaissance and communications for supporting military activities and the test firing of Direct Ascent Kinetic Kill capability demonstrated the advances made in the field. It is argued that there is a strong correlation between the nuclear and space programmes of a country, to the extent that it is said that the development of space capability was

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115.Johnson-Freese, n. 2, p. 175.

116.Johnson-Freese argues that for both political and legal reasons it may be advantageous for states not to register space objects. Johnson-Freese, n. 2, p. 152.

spawned by nuclear capability,<sup>117</sup> and hence, there is an inherent tendency for policymakers to term space programme along with nuclear programme of a nation as 'strategic'. This portends the possibility of doctrinal thought and employment philosophy developed for nuclear capability being extended for military utilisation of space assets. It is argued that whereas nuclear capability can justifiably be considered a political weapon to deter war, space today is already heavily militarised and extensively utilised in the conduct of military operations by major powers. Any country deprived of the advantages accruing from space capabilities would be severely handicapped in any future conflict; the same needs to be considered while developing a framework for utilisation of space capabilities by the Indian military.

India has been an active member of COPUOS and has played a proactive role in space negotiations for development of international space norms which have not hindered development of our space capabilities. As has been brought out in the paper, the development of international space regime is still informed by realist self-interests of space powers to deny (military) advantages to (potential) adversaries; it would be to our advantage if India's interests and international position are guided by military considerations also rather than purely scientific and diplomatic. There is a requirement for the Indian position in the international fora to be also informed by people who would be tasked to protect Indian space assets and utilise them to achieve India's national objectives in the future. For that it is incumbent on us to build a pool of people trained and also exposed to nuances of space legal regime and diplomacy to be able to ensure that Indian interests and ability to utilise space capabilities are not compromised by any unintended concession in international space negotiations. It is important that we equip ourselves to prevent either a 'Space Pearl Harbour' or an 'NPT moment'. This implies a situation that might place India in a disadvantageous position owing to non-demonstration of a capability that a treaty seeks to prohibit.

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117. The impetus to the space programme was the military necessity of delivering powerful nuclear weapons over large distances.

## CONCLUSION

The advantages offered by space to enhance the security of a nation and contribute to its economic development had always been the primary factor for nations to regulate the exploitation of space. While the initial part of the space age was more guided by the realist aims of countries to secure a military advantage, over a period of time the significant potential of economic benefits that accrue from the capability has also shaped the behaviour of countries. In a world where gaining acceptance of the world community is increasingly becoming a priority for nations to get 'legitimacy' for their actions, the use of non-confrontational methods is becoming a preferred option from the toolkit of national power.

While diplomacy has been a recognised means of achieving national objectives, in the contemporary environment the use of law is becoming a preferred option for governments across the globe. 'Lawfare' has always been utilised by nations for shaping the environment to gain strategic advantage even though the term has gained acceptance only in recent times. The space race between the world's two Superpowers at the peak of the Cold War expectedly created security apprehensions in both camps, and it was in the interest of both to shape a legal regime governing exploitation of space in a manner that prevented one adversary from gaining any significant advantage over the other without impeding furtherance of own interests. The international space regime today—which is primarily founded on the Outer Space Treaty of 1967—was negotiated by the two space powers on the realist motivations to secure individual military advantage and denying the same to the adversary while seeking legitimacy of actions under the rubric of international cooperation. The behaviour of major spacefaring nations with respect to the space legal regime since then is still guided by individual national interests. It is important that the Indian policymakers and practitioners entrusted to safeguard national space assets are sensitised to the motives of established spacefaring nations to ensure that 'legal' attempts (if any) to impede our ability to utilise space capabilities are not successful.

# GEOPOLITICS AND GAS PIPELINES: CASE STUDY OF NATURAL GAS PIPELINES

VIKAS NAGAL

The quest for energy security is forcing countries to realign their geopolitical orientations. The geostrategic competition between the US and Russia has spilled over in the energy arena for the control of rich hydrocarbon resources in foreign lands especially in Caspian Sea and Central Asia. The rise of populism is threatening to undo the EU's unity and stability. Ukraine remains a quagmire that is affecting the roles of great powers as well as the future routes of natural gas pipelines. The most intense competition is currently happening in the relatively shallow bodies of waters like South China Sea (between China and Southeast Asian countries), Eastern Mediterranean (between Greece and Turkey) and Black Sea (between the US and Ukraine on the one side and Russia on the other). These water bodies are believed to contain substantial oil and natural gas reserves. The process of laying a pipeline in these waters is becoming an issue of disagreement between various stakeholders. Natural gas is often referred to as "bridging fuel" for its potential to reduce emissions by edging out, for example, coal as a source of electricity production and diesel as an automobile fuel. In the carbonised world, reducing carbon emission and pursuit of economic development is becoming increasingly challenging for the countries around

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**The need for energy security is increasingly setting the agenda for countries and natural gas is gradually taking the centre stage. The demand for natural gas is increasing at a rapid pace as it has a low carbon footprint as compared to oil and coal.**

the globe. In this context, this paper will try to understand the geopolitics involving the natural gas pipelines in the European region.

## INTRODUCTION

The power struggle for natural gas pipelines can be called the defining geopolitical theme of the post-Cold War world. Natural gas pipelines are rapidly emerging as the next big prize in the high stakes arena of energy politics. "What oil was to the twentieth century; natural gas will be to the twenty

first."<sup>1</sup> The need for energy security is increasingly setting the agenda for countries and natural gas is gradually taking the centre stage. The demand for natural gas is increasing at a rapid pace as it has a low carbon footprint as compared to oil and coal.

Natural gas has grown from a marginal fuel consumed in regionally disconnected markets to a fuel that is transported across great distances for consumption in many different economic sectors.<sup>2</sup> According to *International Energy Outlook*, the demand for natural gas<sup>3</sup> worldwide is projected to increase from 120 trillion cubic feet (TCF) in 2012 to 203 trillion cubic feet (TCF) by 2040. The demand for natural gas demand has increased in recent decades because of three main factors: (a) increase in awareness about the dangers of climate change (gas has low carbon footprint as compared to oil and coal); (b) increase in the global demand for gas (especially in developing countries like China and India, which have a huge population base, and are one of the fastest growing economies); (c) renewable energy cannot replace

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1. Michael T. Klare, "The Geopolitics of Natural Gas", *The Nation*, January 23, 2006, <https://www.thenation.com/article/archive/geopolitics-natural-gas/>. Accessed on January 6, 2020.
  2. "Gas 2019: Analysis and Forecast 2024", International Energy Association, June 2019, <https://www.iea.org/reports/market-report-series-gas-2019>. Accessed on January 11, 2020.
  3. "International Energy Outlook 2016 with Projection to 2040", May 2016, [https://www.eia.gov/outlooks/ieo/pdf/0484\(2016\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2016).pdf). Accessed on January 16, 2020.



non-renewable energy as a primary source of energy in the next few decades.<sup>4</sup>

The world's largest natural gas reserves are located mainly in West Asia, Russia, and Central Asia, far from Western Europe, East Asia and Southeast Asia where demand is greatest. There are only two ways to transport natural gas, either through pipelines or tankers (in the form of Liquefied Natural Gas). However, the most economical and efficient way to transport natural gas is through pipelines, which are increasingly becoming the primary source of a safe and constant supply of natural gas. But pipelines have to traverse through the territory of a sovereign state (or states), and thus are tethered to geography.<sup>5</sup> The natural gas pipeline agreements are long-term contracts<sup>6</sup> in nature, because they provide safety of demand for the producer country and safety of supply for purchaser country (or countries). The destination clause prohibits the buyer from reselling the gas to other countries than those for which it is intended. The destination clause enables a supplier to charge differential pricing for the same product

**The most economical and efficient way to transport natural gas is through pipelines, which are increasingly becoming the primary source of a safe and constant supply of natural gas. But pipelines have to traverse through the territory of a sovereign state (or states), and thus are tethered to geography.**

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4. Robert Lyman, "Why Renewable Energy Cannot Replace Fossil Fuels by 2050", *Friends of Science*, May 1, 2016, <https://www.ourenergypolicy.org/resources/why-renewable-energy-cannot-replace-fossil-fuel-by-2050>. Accessed on January 16, 2019.

5. Ilhan Oguz Akdemir, "Global energy circulation, Turkey's geographical location and petropolitics", *ScienceDirect*, 2011, <https://www.sciencedirect.com/science/article/pii/S1877042811012249>. Accessed on January 16, 2019.

6. Most of the Natural Gas Pipeline agreements contain "Buy or Pay Clause" which means that either you purchase an agreed amount of natural gas or pay for refusal to buy natural gas. "Buy or Pay clause" are included in contracts because to transport natural gas through pipelines requires a huge investment in infrastructure. So investors are assured by the "Buy and Pay clause" that their investment is secured. Jeffrey M. Petrash, "Long-Term Natural Gas Contracts: Dead, Dying, or Merely Resting?" *Energy Law Journal*, 2006, <https://www.semanticscholar.org/paper/Long-Term-Natural-Gas-Contracts%3A-Dead%2C-Dying%2C-or-Petrash/b6bab9bba064f868cb1531fda02d97e4b34c5f4e# citing-papers>. Accessed on January 16, 2020.

in different countries.<sup>7</sup> So the very nature of natural gas pipeline agreements binds the producing, consuming and transit state (through whose territory the pipeline is passing) politics. The recent Nord Stream 2 natural gas pipelines project controversy is a classic example of this. The pipelines will supply 55 billion cubic metres (BCM) of natural gas to the Western European market. It will reduce Russian dependence on Ukraine to supply its natural gas to Western Europe. Moreover, it will increase the Western European countries'—especially Germany's—dependence on Russian gas. Thus, the rising demand for natural gas influences relations between major natural gas producing countries and consuming countries.

Another key factor in the geopolitics of natural gas is the heavy concentration of natural gas reserves in a relatively small number of producing countries. The top four producing countries—the US, Russia, Iran, and Canada—hold more than 50 percent of the world's natural gas reserves.<sup>8</sup> The recent shale revolution in the US made it one of the biggest producers of natural gas and oil and net energy exporter.<sup>9</sup> But most of the US natural gas will be sold in the North American market (because of well laid natural gas pipeline infrastructure) and will remain out of the emerging markets in Asia, Africa, and Eastern Europe. Also, according to the World Bank report, natural gas pipelines longer than 3,000 miles are not commercially viable.<sup>10</sup>

Furthermore, the spectre of climate change has forced countries to correct their course and decrease carbon emissions. With this, the dependence on oil is decreasing and natural gas is increasingly gaining importance in the world's

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7. Varvara Fomina, "Who Pays the Most for Russian Gas in Europe and Why", *ProJourno*, August 18, 2014, <http://projourno.org/2014/08/who-pays-the-most-for-russian-gas-in-europe-and-why/>. Accessed on January 2, 2020.

8. "Global Energy Statistical Yearbook 2019", *Enerdata*, <https://yearbook.enerdata.net/natural-gas/world-natural-gas-production-statistics.html>. Accessed on January 15, 2020.

9. Lucas Laursen, "US Set to Become Net Energy Exporter for First Time since 1953", *Fortune*, January 25, 2019, <https://fortune.com/2019/01/25/us-net-energy-exporter/>. Accessed on January 11, 2020.

10. "Cross-Border Oil and Gas Pipelines: Problems and Prospects", World Bank, June 2003, <https://siteresources.worldbank.org/INTOGMC/Resources/crossborderoilandgaspipelines.pdf>. Accessed on January 6, 2020.

energy markets.<sup>11</sup> The future growth of a country depends upon uninterrupted access to energy resources at reasonable prices, and the rate of carbon emission allowed to that country. That is why nations like China are thinking of ways and means to diversify their energy needs, and carbon emission trading became the most trending topic. In this geostrategic competition, natural gas pipelines are increasingly becoming tools to influence the regional balance of power, and their commercial aspects are becoming secondary.

The ongoing civil war in Syria, which has led to the death and displacement of millions of people, is the perfect example of pipeline politics. In 2009, Qatar approached Syria with a proposal to construct a natural gas pipeline from Qatar's North fields in the Persian Gulf to Europe via Syria and Turkey. The natural gas pipeline project was backed by the United States because it will diversify the source of natural gas in the European market and will reduce Russian dominance in the European energy sector. But the Syrian government rejected the Qatari proposal in 2009 because they do not want to annoy their strategic partner, Russia, by challenging its dominance of Europe's gas market.<sup>12</sup> However, in July 2011, the governments of Iran, Iraq, and Syria signed a 10 billion dollar natural gas pipeline agreement in the midst of a civil uprising. The civilian uprising turned into armed insurgency after the Iran-Iraq-Syria natural gas pipeline agreement was signed. In the Syrian civil war, North Atlantic Treaty Organisation (NATO), along with Qatar and Saudi Arabia supported the rebels, while Iran and Russia supported the Syrian government. According to Pepe Escobar, a seasoned voice on the region, "The Iran-Iraq-Syria pipeline—if it's ever built—would solidify a predominantly Shiite axis through an economic, steel umbilical cord."<sup>13</sup>

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11. Louise Gray, "Era of Cheap, easy oil is over, warns study", *Telegraph*, October 8, 2009, <https://www.telegraph.co.uk/news/earth/earthnews/6269455/Era-of-cheap-easy-oil-is-over-warns-study.html>. Accessed on January 16, 2020.

12. Nafeez Ahmed, "Syria intervention plan fueled by oil interest, not chemical weapon concern", *The Guardian*, August 30, 2013, <https://www.theguardian.com/environment/earth-insight/2013/aug/30/syria-chemical-attack-war-intervention-oil-gas-energy-pipelines>. Accessed on December 20, 2019.

13. Pepe Escobar, "Syria's Pipelineistan War", *Al Jazeera*, August 6, 2012, <https://www.aljazeera.com/indepth/opinion/2012/08/201285133440424621.html>. Accessed on January 2, 2020.

In this context, pipeline politics constitute an important and seminal pillar of energy politics. Pipelines are used in oil, gas and electricity sectors, but it is in gas trade that their role has been more pronounced and crucial, predominantly for technical reasons related to the physical properties of natural gas. From the start, pipelines have dominated the gas trade and the politics surrounding it. In recent years, a quiet revolution is taking place in gas transport, in the form of Liquefied Natural Gas (LNG). In the coming years, according to some observers, LNG will make up of 40-50 percent of gas trade,<sup>14</sup> These expectations overlook an important factor which is the uneven progression of LNG in different regional markets. While, in the Asian market, LNG is increasing in importance, till date it has played a limited role in the European gas market on account of the extensive pipeline network in Europe. This paper will look into Russian natural gas export pipelines as a geostrategic game play in order to counter the probable American encroachment on Russia's sphere of influence in the European region. It will try to analyse Europe's inability to diversify its natural gas supplies and its effect on Europe's relations with Russia. This will be analysed in the backdrop of increasing competition for natural gas pipelines in Europe on the world's LNG markets.

### **THE GREAT PIPELINE OPERA: EUROPE FROM YAMAL TO NORD STREAM 2 PIPELINE**

The Cold War divided Europe into two rival ideological camps and lasted for nearly half a century.<sup>15</sup> The Iron Curtain over Europe was lifted after the disintegration of the Soviet Union and countries in Eastern Europe and Central Asia gained independence. Finally, it seemed that "end of history" was near and Europe would never be divided again on nationalist, cultural or ideological lines. But that optimism did not last long. The United States

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14. Yichen Du and Sergey Paltsev, "International Trade in Natural Gas: Golden Age of LNG?" MIT Joint Program on Science and Policy of Global Change, November 2014, <https://pdfs.semanticscholar.org/0a8f/2b82f9376b512feb9169fdf216d054cd2008.pdf>. Accessed on January 1, 2020.

15. The capitalist camp was led by the US and includes Western European countries, whereas the communist camp was led by the Soviet Union and includes Eastern European countries.

of America's policy of expanding NATO eastward led to the feeling of encirclement in Russia. The Russians felt threatened by this move because the US wanted to encroach upon their traditional sphere of influence. This has led to the renewal of geopolitical competition between Russia and the US for control of Eastern Europe. Ukraine is increasingly becoming ground zero for the Russian-US rivalry in Eastern Europe. In recent years, because of US prodding and Russian threat, joining the EU and NATO became the strategic objective of Ukraine.<sup>16</sup> But many member states did not support the idea of Ukraine joining NATO because they do not want to strain their relationship with Russia. After the Russian invasion of Crimea in 2014, the US and Western European countries imposed crippling sanctions on Russia, which led to the near collapse of the Russian economy. The Russians retaliated by launching the so-called "hybrid warfare"—the use of proxies, disinformation, interference in foreign elections, and other measures short of war to escape the Western chokehold before it became fatal.<sup>17</sup> In this geopolitical competition, natural gas and its associated infrastructure like pipelines, LNG import terminals, etc., are increasingly used by countries as a tool to tip the balance of forces in their favour. The following paragraph looks into various natural gas pipeline projects in Europe and how they are affecting EU foreign policy stance, especially in relation to Russia.

### *Yamal Pipeline*

In July 1981, Western Germany and Soviet Union had concluded a framework agreement for supply of natural gas from Yamal Peninsula (Siberia) to Western Europe through pipelines, which would pass through Ukraine, Belarus and Poland (at that time members of Soviet-led Warsaw pact).<sup>18</sup> But the US government's stand from the beginning was against the

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16. Steven Piffer, "NATO's Ukraine Challenge", Brookings, June 2019, <https://www.brookings.edu/blog/order-from-chaos/2019/06/06/natos-ukraine-challenge/>. Accessed on January 24, 2020.

17. Jovana Marovic, "War of Ideas: Hybrid Warfare, Political Interference, and Disinformation", Carnegie Endowment for International Peace, November 28, 2019, <https://carnegieeurope.eu/2019/11/28/wars-of-ideas-hybrid-warfare-political-interference-and-disinformation-pub-80419>. Accessed on January 4, 2020.

18. Yamal-Europe pipeline or Urengoy-Pomary-Uzhhorod Pipeline or Trans-Siberian Pipeline.

**The Western European countries' perception of the threat posed by the Soviet Union differed from that of the United States, and they considered that Moscow's dependence on Western technology would considerably reduce Moscow's options of using energy as leverage in its relations with Western Europe.**

Yamal-Europe natural gas pipeline project going forward. The US government viewed the Yamal pipeline project through the geopolitical lens<sup>19</sup> and considered it one of the significant tools aimed at spreading Moscow's influence in the European region, especially Western Europe. The Yamal pipeline project was agreed upon during the Cold War. This was also the time when the Soviets invaded Afghanistan (1979) and the Iran-Iraq war (1980-1988) was in full swing. The US government had imposed sanctions against the Western companies which were supplying pipes and other gas-transport related equipment for the Yamal pipeline

project, because the Soviet Union did not have the necessary technology to lay the pipelines.<sup>20</sup> The unilateral imposition of sanctions drew a wedge between the US and its Western European allies, as the latter dismissed both the US government arguments and (their) sanctions proposal. The Western European countries' perception of the threat posed by the Soviet Union differed from that of the United States, and they considered that Moscow's dependence on Western technology would considerably reduce Moscow's options of using energy as leverage in its relations with Western Europe. Ultimately, in November 1982, the US government lifted the embargo after it realised that its sanctions strategy had backfired and alienated its strategic

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19. The US government at that time thought that the Soviet Union would use the money earned by selling natural gas to intensify military spending. Secondly, it would increase the Soviet's role in providing vital energy resources to Western Europe. "USSR-Western Europe: Implications of Siberia-to-Europe Gas Pipeline—An Intelligence Assessment", National Foreign Assessment Centre", March 1981, [https://www.cia.gov/library/readingroom/docs/DOC\\_0000500594.pdf](https://www.cia.gov/library/readingroom/docs/DOC_0000500594.pdf). Accessed on December 19, 2019.

20. Under the "Gas for Pipe" deal, the USSR will supply gas to Europe for 25 years and Western companies will lay the pipelines.

allies in Western Europe.<sup>21</sup> But, in 1991, the Soviet Union disintegrated. After the end of the Cold War, Russia inherited contracts to supply gas to Europe. It was one of the biggest sources of hard currency for Russia's post-Soviet reeling economy.<sup>22</sup> But there was a glitch: the Soviet pipelines were laid across Belarus and Ukraine, which were part of the then Soviet empire. After the fall of the Soviet Union they became independent and demanded transit fees and low-priced natural gas supplies in exchange for maintaining Russia's energy supplies to Europe.<sup>23</sup> After their independence from the Soviet Union, Azerbaijan and Central Asian countries also aspired to sell gas to Europe via Turkey through pipelines.<sup>24</sup>

The Russian government realised the need for alternative routes to increase its gas exports and to maintain its dominance in the European gas market. Russia sought ways to decrease its dependence on Ukraine for supply of its gas to Europe. The Blue Stream pipeline was the opening move of the Russian gas game.<sup>25</sup> The pipeline was laid across the bottom of the Black Sea to supply natural gas to Turkey. The Blue Stream pipeline project allowed Russians to compete in the Turkish market, but it did not solve the bigger problem of Russia's dependence on Ukraine to supply its gas to the European market.<sup>26</sup>

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21. Oliver C. Diggle, "The Reagan Pipeline Sanctions: Implications for U.S. Domestic Policy and the Future of International Law", *Towson University Journal of International Affairs*, Fall 2016, <https://cpb-us-w2.wpmucdn.com/wp.towson.edu/dist/b/55/files/2017/11/REAGAN-PIPELINE-SANCTIONS-19q4sd1.pdf>. Accessed on January 25, 2020.

22. Leonid Bershidsky, "Putin's Grand Gas Project Makes Sense Now", *Bloomberg*, December 25, 2019, <https://www.bloomberg.com/opinion/articles/2019-12-26/putin-s-grand-gas-project-makes-sense-now>. Accessed on December 7, 2019.

23. "Russia's Gazprom pays \$2.9 bn to settle Ukraine dispute", *EURACTIV*, December 21, 2019, <https://www.euractiv.com/section/energy/news/russias-gazprom-pays-2-9-bn-to-settle-ukraine-dispute/>. Accessed on December 28, 2019.

24. Central Asian countries and Azerbaijan gained their independence from the Soviet Union in 1991. Earlier their gas was supplied to Russia, which further sold it in Europe. After independence, these countries wished to diversify their supply routes to decrease their dependence on the Russian pipelines system to supply their gas to Europe.

25. The capacity of the pipeline is 16 billion cubic metres per year and it was opened in 2003. All of the gas supplied through Blue Stream is earmarked for the Turkish domestic market only.

26. In 2004-2005 more than 80 percent of Russian gas export to the EU passed through Ukraine. Data on natural gas export to Europe through Ukraine: <http://www.naftogaz-europe.com/article/en/naturalgastransitviaukraine2017>. Accessed on December 14, 2019.

**After the gas price dispute between Ukraine and Russia, Europeans began to see Russia as not a reliable supplier of energy but a petrostate that privileged its political organisation over its commercial obligations.**

In 2006, Russia shut off gas supplies to Ukraine ostensibly due to a price dispute,<sup>27</sup> in turn denying gas to millions of Europeans as well. At that time, most of the Russian gas passed through Ukraine and there was no alternative route to supply Russian gas to the Western European market. After the gas price dispute between Ukraine and Russia, Europeans began to see Russia as not a reliable supplier of energy but a petrostate<sup>28</sup> that privileged its political organisation over

its commercial obligations. To reduce their dependence on Russian gas, the European Union (EU) backed the Nabucco pipeline project. This event alarmed the Russians to counter the European moves to import natural gas from Caspian Sea and West Asia through the Nabucco pipeline.

### *Nabucco vs. South Stream Pipeline*

In February 2002, Bulgaria, Hungary, Austria, Turkey and Romania signed a protocol to construct the Nabucco pipeline.<sup>29</sup> Nabucco would bring gas from West Asian and Caspian fields across Turkey and into Europe. The most important thing about the Nabucco pipeline was that it would diversify the source of natural gas in Europe and completely bypass Russia. Specifically, the

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27. The most plausible explanation for Russia's action is its concern about Kyiv's pro-Western stance and loss of political influence in Central and Western Ukraine. Andrew E. Kramer, "Russia Cuts off gas to Ukraine in Cost Dispute," *New York Times*, January 2006, <https://www.nytimes.com/2006/01/02/world/europe/russia-cuts-off-gas-to-ukraine-in-cost-dispute.html>. Accessed on January 2, 2020.

28. A Petrostate is a country which gets aggressive and ambitious on the international stage once it accumulates substantial oil and gas revenues. When the Soviets invaded Afghanistan in 1979, the oil price was at that period's peak of \$101 a barrel. Russia's war with Georgia in 2008 took place when the price of oil hit its highest point since 1980 (\$105 a barrel). Maria Snegovaya, "Think of Russia as an ordinary petrostate, not an extraordinary superpower", *Washington Post*, March 9, 2015, <https://www.washingtonpost.com/news/monkey-cage/wp/2015/03/09/to-understand-russia-think-of-it-as-an-ordinary-petrostate-as-opposed-to-an-extraordinary-superpower/>. Accessed on January 6, 2020.

29. The Nabucco Pipeline name was taken from the famous Italian language Opera Nabucco, composed by Giuseppe Verdi.



stakes for Central and Eastern European states are even higher because they are the ones who are more dependent on Russian gas and they have to pay more than Western European counterparts who are less dependent on Russian gas supplies.<sup>30</sup> But the big powers in Western Europe like Germany, France, and Italy did not support the project since they were less dependent on Russian gas at that time. Furthermore, they did not wish to antagonise Moscow by bringing non-Russian gas into the market through former Soviet satellites states. But the Ukraine-Russia gas price dispute in 2006 forced European states to put their house in order (at that time more than 80 percent of natural gas of Russia travelled to Europe through Ukraine). The support for the Nabucco pipeline dramatically grew overnight throughout Europe. The Nabucco pipeline project was also backed by the US for the reason that it would decrease Russian influence in the European gas market and allow Caspian region countries like Azerbaijan and Turkmenistan to supply their gas to Europe through Turkey without going through Russian routes.

The Nabucco project was at the heart of Europe's grand strategy to diversify its energy sources and reduce its dependence on Russian gas. But the Nabucco pipeline project became a victim of geopolitical power play in the region at that time. First, the Russia-Georgia war in 2008 over the wayward province of South Ossetia fully exposed the vulnerability of gas pipelines passing through the Caucasus region. After the fall of the Soviet Union, the countries in Central Asia and the Caucasus gained independence but they were dependent on Russians to export their oil and gas to European countries. Their desire to diversify supply routes came into direct conflict with Russian interest in the region because it challenged Russia's dominance of the European gas market and it lost millions of dollars in transit fees. The EU, with US backing, had been trying to wean itself off energy dependence on Moscow by developing a network of energy routes through the Caucasus (Georgia).<sup>31</sup> The construction of the Baku-Tbilisi-Ceyhan

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30. "Reducing European Gas Dependence on Russian Gas: Distinguishing Natural Gas Security from Geopolitics", Oxford Institute for Energy Studies, October 2014, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/10/NG-92.pdf>. Accessed on December 24, 2019.

31. Baku-Tbilisi-Ceyhan (BTC) pipeline completely bypasses Russian territory and transports gas from Caspian Sea across Caucasus (especially Georgia) to Turkey. BTC pipeline is a major geopolitical coup for the EU and the US and a loss to Russia.

(BTC) pipeline was the first step in that direction. The oil pipeline was completed in 2006 and it will supply oil from the Caspian Sea across Tbilisi (Georgia) to Ceyhan (Turkey) and from there it will be supplied to the European market. During the Russian-Georgian War, Russian warplanes repeatedly targeted the Baku-Tbilisi-Ceyhan pipeline. The purpose of targeting the Baku-Tbilisi-Ceyhan pipeline was to deprive Georgia of hundreds of millions of dollars in transit fees and more importantly send a signal to the wider region that you cannot bypass Russia in its traditional sphere of influence without a cost. Second, Western sanctions on Iran were a major blow to the Nabucco pipeline project.<sup>32</sup> Originally, it was hoped that the gas for the Nabucco pipeline would come from Iran. But the sanctions on Iran forced the Nabucco consortium to opt for Azerbaijan. Finally, in June 2013, after Shah Deniz consortium decided to prefer Trans-Adriatic Pipeline<sup>33</sup> over Nabucco pipeline project, the Nabucco pipeline plan was aborted. The consortium that chose the Trans-Adriatic Pipeline over the Nabucco to transport Azeri gas to Europe pointed to higher gas prices in Italy and Greece as the main reason<sup>34</sup> behind the decision. But press reports at that time had suggested that Azerbaijan did not want to annoy its Russian neighbour, who had its own South Stream pipeline project as a rival to the Nabucco pipeline.<sup>35</sup> More importantly, Greece and Italy at that time were in the grip of tough austerity measures,<sup>36</sup> and would not be able to buy enough of the gas to make the venture profitable.

In 2007, Russia launched the South Stream pipeline project that would supply gas under the Black Sea via Bulgaria to the EU. The South Stream

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32. David Ramin Jalilvand, "Iran's gas exports: Can past failure become future success?" The Oxford Institute for Energy Studies, June 2013, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/06/NG-78.pdf>. Accessed on December 12, 2019.

33. Trans-Adriatic Pipeline will supply gas to Southern European countries like Greece and Italy.

34. "Nabucco West loses out to TAP in Shah Deniz II gas pipeline project", *World Pipelines*, June 27, 2013, [https://www.worldpipelines.com/business-news/27062013/nabucco\\_west\\_loses\\_out\\_to\\_tap\\_in\\_shah\\_deniz\\_ii\\_gas\\_pipeline\\_project\\_360/](https://www.worldpipelines.com/business-news/27062013/nabucco_west_loses_out_to_tap_in_shah_deniz_ii_gas_pipeline_project_360/). Accessed on December 18, 2019.

35. Leslie Palti Guzman, "Don't cry for the Nabucco pipeline", Reuters, May 1, 2014, <http://blogs.reuters.com/great-debate/2014/05/01/dont-cry-for-the-nabucco-pipeline/>. Accessed on January 3, 2020.

36. Susannah Verney and Anna Bosco, "Living Parallel Lives: Italy and Greece in an Age of Austerity", *South European Society and Politics*, February 12, 2014, <https://www.tandfonline.com/doi/full/10.1080/13608746.2014.883192>. Accessed on January 22, 2020.

pipeline was the rival of the Nabucco pipeline<sup>37</sup> and was proposed by the Russian government to maintain their stranglehold on the EU gas market and decrease their dependence on Ukraine to export gas to Europe. Many energy analysts at that time believed that it was very difficult to build a pipeline through the Black Sea as it required an enormous amount of money. But the Russian government was hell-bent on completing the pipeline project at any cost. However, in December 2014, Russia withdrew from South Stream pipeline project because Bulgaria did not allow the pipeline to pass through its territorial waters after pressure from EU and withdrew from the project.<sup>38</sup> The Russian decision to cancel the South Stream pipeline came at the time of increased diplomatic tension with the EU (which had adopted sanctions against Russia after its annexation of Crimea in March 2014).

Tensions with EU over the annexation of Crimea (Ukraine) further strengthened the resolve of the Russian government to build alternate supply routes to Europe. In the same year, Russia signed an agreement with Turkey for the Turk Stream natural gas pipeline project.<sup>39</sup> TurkStream is the replacement of the South Stream project, and it supplies gas to Eastern European countries through Turkey. TurkStream was also backed by the Turkish government because it will cement Turkey's position as a gateway to the European gas market.<sup>40</sup> In January 2020, Russian President Vladimir Putin and Turkish President Recep Tayyip Erdogan formally launched the TurkStream gas pipeline. The TurkStream pipeline will further reduce Russian dependence on Ukraine to supply its gas to Europe and strengthen the nascent Turkish-Russian alliance.<sup>41</sup>

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37. South Stream and the Nabucco pipelines follow a similar path and both pipelines target the Central European market.

38. Tim Boersma, "The Cancellation of South Stream is a Pyrrhic Victory, At Best", Brookings, December 2014, <https://www.brookings.edu/blog/up-front/2014/12/18/the-cancellation-of-south-stream-is-a-pyrrhic-victory-at-best/>. Accessed on December 27, 2019.

39. The Turk Stream consists of two pipelines with a total capacity of 31.5 billion cubic metres (BCM).

40. John Roberts, "The Turkish Gate: Energy Transit and Security Issues", *Turkish Policy Quarterly*, [https://esiweb.org/pdf/esi\\_turkey\\_tpq\\_id\\_13.pdf](https://esiweb.org/pdf/esi_turkey_tpq_id_13.pdf). Accessed on December 15, 2019.

41. Turkey purchased S-400 missile defense system from Russia which had sparked a major diplomatic crisis within NATO; also Turkey and Russia are cooperating in Northern Syria. Keith Johnson and Robbie Gramer, "Who Lost Turkey", *Foreign Policy*, July 2019, <https://foreignpolicy.com/2019/07/19/who-lost-turkey-middle-east-s-400-missile-deal-russia-syria-iraq-kurdish-united-states-nato-alliance-partners-allies-adversaries/>. Accessed on December 22, 2019.

**When the Nord Stream 2 pipelines project is completed, it will consolidate Russia's dominant status in the European gas market and further diversify its supply routes. Most importantly, after the completion of the Nord Stream 2 pipelines, Ukraine will lose its status as Russia's gateway into the European gas market.**

### *Nord Stream Pipelines System*

The Nord Stream natural gas pipeline project is the most important in the European perennial pipeline opera. The Nord Stream is a system of offshore natural gas pipelines from Russia across to the Baltic Sea bypassing Eastern and Central European countries like Ukraine, Poland, etc.<sup>42</sup> The first two pipelines (known as Nord Stream 1) were completed in October 2012, whereas two more pipelines (known as Nord Stream 2) are in their final phase.<sup>43</sup>

But, in December 2019, the US government imposed unilateral sanctions against Western companies which were laying deep sea pipelines for the Nord Stream 2 project. After the imposition of sanctions against the Nord Stream 2 project, a Swiss-Dutch company *Allseas*, which was laying the pipelines, suspended work to avoid US sanctions.<sup>44</sup> The imposition of sanctions by the US will delay the laying of pipelines. However, the Nord Stream 2 project will be completed because Russia and other Western European countries are eager to complete the project and most of the pipeline laying work is already completed.<sup>45</sup>

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42. Mikhail Korchemkin, "With Gazprom's Nord Stream 2, Putin is Getting Ready to Put Screws on Europe", *Foreign Policy*, October 2019, <https://foreignpolicy.com/2019/10/07/gazproms-nord-stream-2-will-help-putin-cut-off-natural-gas-supplies-to-europe/>. Accessed on January 12, 2020.

43. The capacity of Nord Stream 1 pipeline is 55 billion cubic metres (BCM) and Nord Stream 2 capacity in 55 billion cubic metres, which make the total capacity of Nord Stream pipelines 110 Billion Cubic Metres.

44. Vanand Meliksetia, "Nord Stream 2 Sanctions Are A Win-Win For Putin", *Oil Price*, December 23, 2019, <https://oilprice.com/Energy/Natural-Gas/Nord-Stream-2-Sanctions-Are-A-Win-Win-For-Putin.html>. Accessed on December 27, 2019.

45. Stuart Elliott, "So close: Nord Stream 2 gas links completion trips at last hurdle", *S&P Global Platts Insight*, January 7, 2020, <https://blogs.platts.com/2020/01/07/nord-stream-2-gas-pipeline-trips-at-last-hurdle/>. Accessed on January 18, 2020.

When the Nord Stream 2 pipelines project is completed, it will consolidate Russia's dominant status in the European gas market and further diversify its supply routes. Most importantly, after the completion of the Nord Stream 2 pipelines, Ukraine will lose its status as Russia's gateway into the European gas market. The Nord Stream 1 and 2 and TurkStream pipelines projects were designed by the Russian government to punish Ukraine by depriving it of transit fees.<sup>46</sup>

In March 2014, Russia annexed Crimea from Ukraine and provoked a major geopolitical crisis. The United States and the EU responded by imposing sanctions against the Russian state. The economic sanctions hit the Russian economy very hard and its oil and gas companies had lost access to the Western technology. But in recent years production of gas in the North Sea<sup>47</sup> has decreased, Qatari gas is out of reach for the Western European countries because of the Syrian civil war, and reimposition of sanctions by the US government on Iran also closed another important gas market for the European countries. This has put the Western European countries, especially Germany (the economic powerhouse of Europe), into a difficult position. The domestic pressure to reduce carbon emissions and lack of other commercially viable options to import gas put the Western European countries like Germany on a path that will increase their dependence on Russian gas<sup>48</sup> and will weaken their united front in the Russia-Ukraine dispute.

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46. Ukraine collected US\$ 3 billion in transit fees last year, which is 3 percent of its annual budget. Steven Pifer, "Congress, Nord Stream II, and Ukraine", Brookings, November 12, 2019, <https://www.brookings.edu/blog/order-from-chaos/2019/11/12/congress-nord-stream-ii-and-ukraine/>. Accessed on January 3, 2020.

47. Most of Western European gas came from North Sea region and onshore fields in Netherlands.

48. After the completion of Nord Stream 2 pipeline, approximately 75 percent of Germany gas import will be from Russia.

**Two major developments in the twenty-first century have transformed the global energy system in the general and gas market in particular. The first is the shift in the centre of demand from developed countries to developing countries like China and India, etc. The second development is the shale revolution in the US that has decreased the US' dependence on energy imports.**

### **RISKING PIVOT: GERMANY AND TURKEY**

Two major developments in the twenty-first century have transformed the global energy system in the general and gas market in particular. The first is the shift in the centre of demand from developed countries to developing countries like China and India, etc. The second development is the shale revolution in the US that has decreased the US' dependence on energy imports. In this changing energy landscape, new alliances are being formed and old ones are rapidly becoming redundant. The recent actions of Germany and Turkey prove this point.

The two countries are perfect case studies of natural gas pipeline politics. Both countries are traditionally considered as part of the western bloc led by the US. But their heavy dependence on imported energy and desire to become "natural gas hub," can lead to their pivot away from the US-led western bloc.

**Germany:** Germany is an export-based economy and is heavily dependent on energy imports for its domestic requirements.<sup>49</sup> First, the competitiveness of German products in the international market depends upon the availability of cheap oil and gas to its industries.<sup>50</sup> Second, Germany will close all civilian

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49. Germany imports more than 60 percent of its primary energy requirements.

50. In Germany, the share of industries in which energy is a key factor for gaining a competitive advantage is larger than in any other western industrialised nation. In 2008, these industries generated over 44 percent of German revenue. In industrialised nations, this share is matched only by Japan with around 43 percent. The European average is much lower, and trailed by the US at 30 percent. "Energy: A key to competitive advantage", McKinsey & Company, April 2009, [https://www.mckinsey.com/~media/mckinsey/dotcom/client\\_service/sustainability/pdfs/energy\\_competitive\\_advantage\\_in\\_germany.ashx](https://www.mckinsey.com/~media/mckinsey/dotcom/client_service/sustainability/pdfs/energy_competitive_advantage_in_germany.ashx). Accessed on January 25, 2020.

nuclear power plants by the end of 2022.<sup>51</sup> Finally, it did not have any LNG import terminal,<sup>52</sup> so it is dependent on pipeline infrastructure for the import of natural gas. It is traditionally considered as part of the US-led international order. In 2006, when Russia had stopped exporting gas to Ukraine, Western European countries like Germany were not affected much because at that time they were less dependent on Russian gas imports than Central and Eastern European countries. During that period, most of the German imports came from the North Sea region and onshore gas fields in the Netherlands. But, in recent years, the demand for natural gas in Germany has increased, whereas the production in the North Sea region and gas fields of the Netherlands has declined. This has forced Germany to look for new markets of natural gas.

The nuclear deal in 2015 with Iran opened the Iranian gas market for the European countries. But that window did not last long because of the unilateral withdrawal of the US from the Iran nuclear deal in May 2018 and reimposition of sanctions on Iran's oil and gas sectors. This has rattled European countries like Germany which were in favour of maintaining closer relations with the Iranian government and also wanted to import natural gas from Iran.<sup>53</sup> The US is also offering to supply LNG to Germany but it will be more expensive than the piped natural gas. This has forced Germany to develop a closer relationship with the Russians for its energy security. Ultimately, with the completion of Nord Stream 2 pipeline, Germany will not only become a major gas importer from Russia, but it will also become a gas hub in Western Europe.<sup>54</sup>

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51. Tsvetana Paraskova, "Germany Aim To Close All Nuclear Plants By 2022", *Oil Prices*, December 30, 2019, <https://oilprice.com/Alternative-Energy/Nuclear-Power/Germany-Aims-To-Close-All-Nuclear-Plants-By-2022.html>. Accessed on January 14, 2020.

52. Rachel Waldholz, "Liquefied Gas—Does LNG have a place in Germany's energy future?" *Clean Energy Wire*, February 12, 2019, <https://www.cleanenergywire.org/factsheets/liquefied-gas-does-lng-have-place-germanys-energy-future>. Accessed on December 11, 2019.

53. Lucas Tichy and Nikita Odintsov, "Can Iran Reduce EU dependence on Russian Gas?" *Middle East Policy Council*, <https://mepc.org/journal/can-iran-reduce-eu-dependence-russian-gas>. Accessed on January 11, 2020.

54. Julia Demirdag, "Germany to become key to EU gas transit-analysts", *Montel*, November 6, 2019, <https://www.montelnews.com/en/story/germany-to-become-key-to-eu-gas-transit-analysts/1057564>. Accessed on January 19, 2020.

When the Nord Stream 2 pipeline project is completed, it will improve bilateral relations between Germany and Russia. In any future conflict between Russia and the US in Eastern Europe, it will be very difficult for Germany to forcefully condemn Russian actions. This will be a major blow to the trans-Atlantic relations and a major diplomatic victory for Russia.

**Turkey:** In European pipeline politics, Turkey has been a key player. Turkey is not a major energy producer country, but it has plans of becoming a gas transit hub because of its favourable geographical position between the gas fields of Caspian region, West Asian region and Europe. Since the foundation of the Turkish Republic it has maintained close relations with the US and is a part of the US-led NATO bloc. But, in the recent years, relations between the US and Turkey have worsened because of US support for the Kurdish-led Syrian democratic forces against Islamic State in Syria, which Turkey considers an offshoot of Kurdish Workers' Party (PKK).<sup>55</sup>

Relations between Turkey and Russia, on the other hand, have improved in recent years because of their close cooperation in northern Syria and Turkey's recent purchase of S-400 missile defence system.<sup>56</sup> The failure of the Nabucco pipeline project and sanctions on Iran also forced Turkey to look towards Russia. The Russian government was also searching for alternative routes to supply its gas to Europe. The Blue Stream pipeline was completed in 2003 for the supply of natural gas to the Turkish domestic market. In 2014, the Russian and Turkish government signed the TurkStream pipeline project, which will supply Russian gas to the European market through Turkey. The TurkStream pipeline was completed in January of this year and it will cement Turkey's position as a transit state for natural gas. The Turkish pivot towards Russia was so rapid and even surprising for many in the region. The US Senate had

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55. "The issues behind worsening Turkey-US relations", *TRT World*, July 19, 2019, <https://www.trtworld.com/turkey/the-issues-behind-worsening-turkey-us-relations-28372>. Accessed on December 28, 2019.

56. Seth J. Frantzman, "Russia and Turkey are becoming allies, overshadowing Israel—Analysis", *Jerusalem Post*, July 29, 2019, <https://www.jpost.com/Middle-East/Russia-and-Turkey-are-becoming-allies-overshadowing-Israel-analysis-597004>. Accessed on December 21, 2019.



imposed sanctions on Turkey for its purchase of the S-400 missile defence system and experts are discussing, “Who Lost Turkey.”<sup>57</sup>

The Turkish stand on East Mediterranean Pipeline project also highlights its pivot away from the US-led international order. In early 2019, East Mediterranean Gas Forum was founded by Israel, Egypt, Jordan, Greece, and Cyprus. The forum was created to develop a regional gas market and ultimately export gas to Europe. The Eastern Mediterranean Sea contains huge reserves of gas and oil. In 2010, a large gas field was discovered off the coast of Israel and in later years other offshore gas fields were discovered in Cyprus and Egypt. This has led to an agreement between Greece, Israel, Egypt, and Cyprus to lay a gas pipeline from Israel to Greece through Eastern Mediterranean.<sup>58</sup> Turkey was excluded from the pipeline project at the insistence of Greece and Cyprus. In 1974, Turkey invaded Cyprus and annexed Northern Cyprus after a long diplomatic spat with Greece. Turkey fears that Eastern Mediterranean Gas Forum is a geopolitical weapon to counter its influence in the region. The Eastern Mediterranean Pipeline is supported by the US because it will reduce Europe’s dependence on Russian natural gas. This is the reason it wants to reassert its dominance in eastern Mediterranean region by supporting factions in Libyan conflicts and sending naval warships to stop Cyprus from exploration and research in the eastern Mediterranean waters.

## **THE IMPLICATION OF EUROPEAN PIPELINE POLITICS ON GAS MARKETS AROUND THE WORLD**

The realisation of a natural gas pipeline project is like a marathon. It takes years for the first shovel to hit the ground for constructing the pipeline. But this metaphor is partially valid. In the last laps of a marathon it becomes

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57. Keith Johnson and Robbie Gramer, “Who Lost Turkey”, *Foreign Policy*, July 2019, <https://foreignpolicy.com/2019/07/19/who-lost-turkey-middle-east-s-400-missile-deal-russia-syria-iraq-kurdish-united-states-nato-alliance-partners-allies-adversaries/>. Accessed on December 22, 2019.

58. East Mediterranean pipeline will transport gas across the Mediterranean to the European countries.

**The United States of America wants to sell its gas in the form of Liquefied Natural Gas (LNG) to the European market. But the US LNG is much more expensive than the piped gas from Russia. That is why most of the Western European countries are not interested in buying American LNG and are opting for Russian gas.**

more apparent who will be the winner.<sup>59</sup> The great gas pipeline game in Europe is entering the advanced stage. The winner of gas pipeline politics in Europe is going to be decided in the coming years after the completion of major natural gas pipelines like East Mediterranean and Nord Stream 2 pipelines.

The main aim of Russia in recent years has been to diversify its supply routes so that it can reduce its dependency on the Ukrainian transit system for the supply of its natural gas. Second, it wants to maintain its stronghold on the European gas market. The TurkStream and Nord Stream pipeline systems were designed

to reduce the flow of gas through Ukraine without affecting the supply of Russian gas to European market.<sup>60</sup> This will be a serious blow to Ukraine because it will lose billions of dollars in transit fees after the completion of these pipeline projects. Second, it will also decrease Ukraine's importance in the EU because it will not remain as a transit state for Russian gas. Third, it will weaken the EU even further by preventing it from developing common EU energy policy<sup>61</sup> to counter Russia's hegemonic plans in the region.

The underdogs in this natural gas pipeline politics are the Eastern European countries and the US. The recent Shale revolution in the US made it one of the biggest producers of oil and gas in the world.

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59. Barcin Yinanc, "Is Nabucco dead, and no one dares to say it?" December 6, 2011, <http://www.hurriyetdailynews.com/opinion/barcin-yinanc/is-nabucco-dead-and-no-one-dares-to-say-it-8499>. Accessed on January 7, 2020.

60. According to Gazprom's (Russian gas monopoly) "optimization program" the company will reduce the capacity of pipelines delivering gas to the Russian-Ukrainian border to 10 billion to 15 billion cubic metres a year, <https://www.gazprom.com/press/news/miller-journal/2016/277026/>. Accessed on December 23, 2019.

61. Richard Wietz, "Countering Russian Energy Diplomacy", International Centre for Defense and Security, June 20, 2014, <https://icds.ee/countering-russian-energy-diplomacy/>. Accessed on December 19, 2019.

The United States of America wants to sell its gas in the form of Liquefied Natural Gas (LNG) to the European market. But the US LNG is much more expensive than the piped gas from Russia.<sup>62</sup> That is why most of the Western European countries are not interested in buying American LNG and are opting for Russian gas. The pressure of climate change is also forcing countries in Europe to switch towards natural gas. The US is also concerned that Western Europe is increasingly becoming dependent on Russian gas imports, which will weaken their resolve to counter Russia's hegemonic plans in Eastern Europe.

**China is importing gas through a pipeline from Russia. In 2025, the major natural gas pipeline project will be completed for export of gas from Russia to China.**

Countries like India and China are increasing their LNG imports from around the world. In the 1990s and 2000s, India was involved in multilateral negotiations for the building of natural gas pipelines from Iran, Turkmenistan and Myanmar.<sup>63</sup> However, these projects failed to make any headway owing to various factors like gas pricing dispute, the changing geopolitical chessboard and fluctuating bilateral relations between the countries involved. Today, India imports a large amount of LNG from countries like Qatar, Australia, the US and Russia and has also been purchasing natural gas from spot markets. In recent years, India has built new LNG import terminals to increase its capacity to import LNG.

The Chinese government is also importing a large amount of LNG and soon it will overtake Japan as the largest LNG importer in the world. China is importing LNG from the US to fulfil its energy demands and to reduce its

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62. Murat Temizer, "US LNG price up to 40% higher than Russian gas: Novak", Anadolu Agency, May 27, 2018, <https://www.aa.com.tr/en/energy/energy-diplomacy/us-lng-price-up-to-40-higher-than-russian-gas-novak/20225>. Accessed on January 7, 2020.

63. Iran-Pakistan-India (IPI) Gas Pipeline Project, Turkmenistan-Afghanistan-Pakistan-India (TAPI) Gas Pipeline Project and Myanmar-India Gas Pipeline Project. Sanket Sudhir Kulkarni, "India's Import Diversification Strategy for Natural Gas: An Analysis of Geopolitical Implications", *Observer Research Foundation*, December 6, 2019, <https://www.orfonline.org/research/indias-import-diversification-strategy-for-natural-gas-58395/>. Accessed on January 11, 2020.

trade surplus with the US.<sup>64</sup> China is importing gas through a pipeline from Russia. In 2025, the major natural gas pipeline project will be completed for export of gas from Russia to China.<sup>65</sup>

Finally, the demand for LNG is going to increase in the coming years, especially in the Asian region where natural gas pipeline infrastructure is non-existent. On the other hand, the demand for LNG in Europe is going to remain steady in the coming years because of the well-established natural gas pipeline infrastructure already in place there. As technological improvements and infrastructure investments reduce the cost of LNG, it will also incentivise European states that are already looking for alternatives gas supply options.<sup>66</sup>

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64. Stephen Stapczynski, "Trade Deal Could Propel US to Top of China's LNG Supplier List", Bloomberg, <https://www.bloomberg.com/news/articles/2019-06-12/trade-deal-could-propel-u-s-to-top-of-china-s-lng-supplier-list>. Accessed on December 9, 2019.

65. The Power of Siberia natural gas pipeline will supply 38 BCM annually from year 2025.

66. Dr. Paula Stern, "The LNG moment: How US production could change more than just markets", *Atlantic Council*, April 16, 2019, <https://www.atlanticcouncil.org/commentary/article/the-lng-moment-how-us-production-could-change-more-than-just-markets/>. Accessed on January 2, 2020.



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