

Pakistan's Nuclear Program: Guarantor of National Security



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Webinar

Pakistan's Nuclear Program: Guarantor of National Security

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STRATEGIC VISION INSTITUTE (SVI), ISLAMABAD

Strategic Vision Institute (SVI) organized a webinar on “*Pakistan’s Nuclear Program: Guarantor of National Security*” on 27th May 2022. The webinar was chaired by Dr. Zafar Iqbal Cheema (President/Executive Director, SVI). The eminent speakers included Dr. Tughral Yamin (Associate Dean, CIPS, NUST, Islamabad), Dr. Rizwana Karim Abbassi (Associate Professor, IR, NUML Islamabad), Dr. Zafar Khan (Executive Director, BTTN, Quetta) and Ms. Ahyousha Khan (Associate Director, SVI). Lt. Gen Naeem Khalid Lodhi (Former Defense Minister, Pakistan) also joined the webinar as discussant.

The major takeaway from the webinar was that Pakistan conducted Nuclear Weapon Test in response to the Indian Operation Shakti. One of the primary aims of Pakistan’s nuclear weapons is to maintain deterrence stability under the evolving strategic environment in South Asia. Moreover, India’s military force modernization has led to revolutionize Indian military thinking and India is moving towards counterforce strategy. Nuclear weapons are maintaining deterrence at larger scale in South Asian but instability at lower-level of conflict is increasing in the form of hybrid war. Pakistan is a confident nuclear weapon state and possesses nuclear weapons for deterrence purposes ensuring strategic stability in the region and for its socio-economic development. The clean history of the utilization of nuclear energy is an indication of Pakistan’s commitment towards the utilization of nuclear power for peaceful purposes. Pakistan gives utmost importance to the security of its nuclear infrastructure, and not a single nuclear related accident has ever taken place.

After offering a warm welcome to the participants and webinar audience, **Dr. Zafar Iqbal Cheema** (Executive Director, SVI) started the session with his introductory remarks. He started by saying that the webinar has been organized to commemorate the Youm-e-Takbeer of Pakistan, which is a response to the India’s Operation Shakti (Pokhran-II). On May 11, 1998, India conducted five nuclear tests and declared it a nuclear weapon state. That was the first ever admission which India has made to be a nuclear weapon state. Although Indian nuclear program dates back to 1960s, the so-called PNE test was conducted in 1974, which was



actually a weapon test. Today, India accepts that it was a weapon test. Since then India has kept a dual and ambiguous posture about acquisition of its nuclear weapons capability.

Dr. Cheema gave the reference of his book on the history of India's nuclear program and said that Nehru sanctioned the work for PNE, but eventually he passed away and an interim government came; followed by Mrs. Gandhi, his daughter who became the prime minister of India; subsequently, in 1971 the war happened, which all delayed their PNE program; and finally they conducted a test on 18th May 1974. That was not only a weapon test, but corresponding to that India also developed a delivery system. Firstly, India relied on aircraft delivery systems, but in 1980s it laid the program for the ballistic missile test which eventually became part of the Indian arsenals to carry nuclear weapons.

Pakistan's nuclear program is a reaction to the India's nuclear program, if at all India wouldn't have gone nuclear, Pakistan also wouldn't have followed the suite, except for the utilization of peaceful uses of nuclear energy. Pakistan laid its first reactor KANNUP-I in 1972 with assistance from Canada and eventually Pakistan had CHASHMA-I, CHASHMA-II, CHASHMA-III, CHASHMA-IV, which exclusively is meant for the generation of electricity, which Pakistan is quite short of within the country. These reactors are under international safeguards and the safeguards of the country which have provided these reactors i-e the People's Republic of China. Similarly, KANNUP-I which is now being decommissioned was under the Canadian Safeguards as well as a under the international safeguards.

Likewise, KANUPP-II and KANUUP-III are under international as well as Chinese safeguards. Pakistan's program is not only for the generation of electricity but also a major mean of Pakistan's socio-economic development. We have almost two dozen centres for the use of nuclear energy in medicine, industry, agriculture, and other fields of social life. Pakistan is not only specializing in these fields, but is also able to export these civilian uses of technologies to other countries. Pakistan's nuclear program is very well respected by the atomic energy commission at Vienna. Pakistan nuclear program is also one of the safest and secure nuclear programs of the world. So far not been a single accident has happened in Pakistan's maintenance of its peaceful uses of nuclear technology and nuclear weapons program, unlike India, where many accidents have taken place. Particularly, the folding of the use of nuclear material (fissile

material) in India has been found at least twice in public. More recently, India's nuclear delivery system BrahMos has been accidentally fired and has landed in Pakistan. That is a major accident that could have been one of the unfortunate events that could have led to the nuclear war between the two countries. Pakistan, however, has shown maturity, patience and strategic leadership by not reacting to the major launch of the missile and India should also cooperate with Pakistan in investigation as to why such a deadly cruise missile has landed into Pakistan.

Dr. Cheema said there are many dimensions to the military and socio-economic dimensions of the Pakistani nuclear program, which the panelists will discuss in the webinar.

Dr Rizwana Abbasi (Professor, IR Deptt., NUML) deliberated upon "*India's Offensive Doctrines/Policies and Corresponding Force Modernization Plan: Threat to South Asian Strategic Stability*". She started by expounding the South Asian strategic scenario and said that the strategic stability in South Asia is quite fragile, region is in flux and weapon asymmetry has aggravated enormously; CBMS are discontinued, and mistrust has deepened, thereby driving the region close to the brink of war. Dr. Abbasi said that there are two-fold reasons for this strategic instability, one- the Indian revisionist behavior and its changing doctrinal strategies and force postures. Indian nuclear policy is based on the commutative Gandhian and Nehruvian policy of greater India, this means that Indian ambitions for maximization of power, and desire to be a great power with a role in constructing and regulating the regional and to some extent global order; second- new great power rivalry in Pakistan's backyard, where India plays a lead role as an anchor for the US against China, certainly leads to undermine settings in South Asia. So, currently Indian status has risen, India while devising policy against China leads to create footprints in broader Asia and beyond, and obviously US considers India as a balancer against China in Asia, thereby India is being mainstreamed in global political and security order.



Similarly, India's global ambitions and its role in favor of US against China has provide it with an opportunity to capitalize its broader national interests while gaining space in the global political and security sphere, thereby undermining regional peace and stability. As in the nuclear

sphere and domain, the Nuclear Suppliers Group waiver through the Indo-US deal has enabled India to not only secure access to world technological market but also embark upon the procurement of advanced technology platforms, thereby indigenizing the technological industry as a non-NPT state. India has marched into space and blue seas, so India advocates that in an event of conflict with China, India would use sea-denial strategies such as naval blockade, to scuttle China's energy supply lines, disrupt its oil and trade lanes in the Indian Ocean. India established Andaman-Nicobar Island and command bases in port Blair aiming at navigating the broader sea-lines in Malacca strait; obstruct Chinese possible infiltration of the Indian Ocean region. This in turn, undermines Pakistan's interests in the region as well. Indo-US defence trade technology initiatives and its logistic support would enhance the operational capability and interoperability allowing crafts and ships to land and refuel.

US and India have inked several deals in military and logistic exchange known as the logistic exchange memorandum of agreement (LEMOA), the communication capability and security agreement (COMCASA) and the BECA agreement. These agreements would certainly allow India better freedom of navigation and mobility in the entire Indian Ocean region, and blue waters of Asia Pacific thereby advancing its defence capacity at the land and to counter China's air access and area denial capability. India is aiming at developing its own air and sea battle operational concepts. Hence, India is rapidly modernizing its naval neck of the nuclear triad. Such Indian military modernization puts considerable pressure on Pakistan's deterrence capabilities. The Indian nuclear strategy for the development of Indian BMD systems, ICBMs, MIRVs, nuclear powered submarines, aircraft carriers and high-tech cutting-edge new technology and deployment of new surveillance means continue to create dent for strategic stability. The Indian short-range missile complicates the regional centric deterrence. Moreover, India's induction of conventional technology such as Rafael further undermines regional stability. India is also acquiring new stealth technology to enhance its air force, to penetrate deep into the territories of neighboring countries such as Pakistan. So, stealth technology allows full penetration to optimal launch point and helps ensure survivability of aircraft and the crew during the mission. So the combination of weapon lethality, gain by accuracy and bomber survivability gained by stealth maximizes the counter-force capability of air force. So, India is indeed working on achieving supremacy to dominate in the domain esp. after Balakot incident between India and Pakistan.

India is working on improvement of reconnaissance, surveillance, and satellite sensors. So, a range of technologies are being developed such as improved seismometers, instruments to map the electromagnetic field and remote type sensors. More so, India's force modernization such as BMD systems, MIRV technology and nuclear power submarines with all type of and range of submarine launch ballistic missiles, its upgrading plan to achieve submarine survivability and anti-submarine warfare exercises in the Indian Ocean region significantly reverberate India's reflection towards counterforce war fighting strategies. Moreover, India's technologies such as precision, conventional strikes and cyber operations, advancement in the sea-based intelligence and guidance system, acquisition of UAVs and satellite systems are the visible indicators that India is opting for the counterforce force strategy. Thus India's military sufficiency and force modernization has led to revolutionize Indian military thinking and India's strategy of disarming Pakistan seems real and premeditated. India is moving away from non-war-fighting to war fighting strategy under the nuclear domain in order to exert more pressure and stress on Pakistan nuclear deterrent force. Thereby, triggering a new arms race and overstretching Pakistan's economy that is already in great depression.

Dr. Abbassi said that the hostility between India and Pakistan has intensified in the backdrop of evolving security patterns between the two countries, particularly after India's revocation of constitutional article 370 and 35A on Kashmir. Additionally the two states fall in the trap of unresolved arms race, raising problems. The conflicting interests of the two states will incentivize further arms development and prompt aggression thereby increasing the prospects of escalation to an undesirable level. Both, Pakistan and India should exercise maximum restraint and resume dialogues and institutionalize arms reduction mechanisms. Both the states should realize that they cannot avoid the risk of nuclear war until they revisit and rationalize their all-inclusive military plans, institute arms control mechanism that reflect doctrinal clarity for the good of people of this region. Moreover, international institutions should strengthen to maintain balance in this region. Theories such as nuclear war can be fought, limited wars can be done under nuclear umbrella ignore the unimaginable human sufferings. So, the only winning move is not to play.

Dr. Tughral Yamin (Associate Dean, CIPS, NUST, Islamabad), deliberated on “*Expansion of Indian Nuclear Program and Pakistani Response*”. He said that on May 28, 2022 marks the day that we responded to the Indian nuclear weapon tests and emerged as a *de facto* nuclear weapon state. This was a moment of intense national pride. It gave a feeling that we as a nation not only had the technical expertise to make the bomb but also the political resolve to stand up to international coercion and threats and do what is best in the national interest.



Dr. Yamin said that nuclear deterrence today forms the core of our national security doctrine. Pakistan’s nuclear weapons are meant solely meant to counter the existential threat posed by India. Therefore, it is necessary to take a look at the Indian nuclear program. He said there are two angles to the Indian nuclear program. One is its capacity to produce fissile material; and the other is its capability to make more accurate and powerful weapons systems, delivery means and robust command and control centers.

India has 23 nuclear power plants in operation producing approximately 6885MWe of electricity. It has 8 nuclear reactors under-construction which are projected to produce 6028MWe. India announced plans to increase electricity production to a total installed capacity of 700 GWe by the year 2032 – this included 63 GWe from nuclear power. In March 2018, the government stated that nuclear capacity would fall well short of its 63 GWe target and that the total nuclear capacity is likely to be about 22.5 GWe by the year 2031. This revised target was reaffirmed by the country’s atomic energy minister in December 2021.

Dr. Yamin mentioned that after the NSG waiver in September 2008, India’s scope for sourcing both reactors and fuel from suppliers in other countries opened up. India has signed civil nuclear cooperation agreements with the USA, Russia, France, UK, South Korea, Czech Republic and Canada, as well as Australia, Argentina, Kazakhstan, Mongolia and Namibia. These deals are worth billions of dollars and have resulted in a massive inflow of technology and nuclear materials to India. Following India’s IAEA safeguards agreement, NSG waiver and US Congress approval of a bilateral trade agreement in 2008, Russia's Rosatom and Areva from

France had signed a contract with India to supply uranium for power generation, and plans with Kazakhstan, Brazil and South Africa are also underway. The Russian agreement was to provide fuel for PHWRs as well as the two small Tarapur reactors. These uranium exports have freed up India's indigenous uranium resources to be used exclusively for weapons purposes. This is increasing the fissile material asymmetries between India and Pakistan, disturbing the deterrence calculations and impacting on strategic stability.

India continues to modernize its nuclear weapons arsenal and operationalize its nascent triad. Bulletin of the Atomic Scientists estimates that India has fissile material for about 150-200 warheads. It has eight nuclear-capable systems: two aircraft, four land-based ballistic missile systems, and two sea-based ballistic missile systems. Various Indian experts and politicians claim India needs more than 300-400 nuclear weapons for its strategic forces. He mentioned that Dr. Anil Kakodkar, the former Chairman of India's Atomic Energy Commission, has said in this regards that, "both, from the point of view of maintaining long-term energy security and for maintaining the 'minimum credible deterrent,' the fast breeder programme just cannot be put on the civilian list. This would amount to getting shackled and India certainly cannot compromise one [security] for the other." So, India has intentionally reserved its fast breeder reactors and most of its so-called civil nuclear programme out of the safeguards and surveillance of the International Atomic Energy Agency (IAEA). In order to acquire the full nuclear triad capability, India will strive to produce many more nuclear warheads without IAEA monitoring.

An in depth analysis has shown that India has enough resources and fissile materials to develop between 356 and 492 nuclear warheads. Whereas, the Belfer Center's study has indicated that India is already installing more than five fast breeder reactors, which will proliferate its production capacities of weapons-grade plutonium 20-fold to 700 kg annually. The analysis of this production capacity demonstrates that New Delhi has the capacity to produce roughly 80 to 90 plutonium-based and 7 to 8 uranium-based nuclear weapons every year. According to the study, if all of the weapons and the reactor-grade Plutonium and the Highly Enriched Uranium stocks are taken into account, India could produce between 2,261 and 2,686 weapons.

Considering the response options of Pakistan, Dr. Yamin said Pakistan has six nuclear power plants in operation. All nuclear power reactors have been supplied by China and use uranium fuel, which is also imported from China. Pakistan's civilian nuclear program is under IAEA safeguards. Pakistan has also planned to construct a fifth reactor at Chashma site which is likely to be a design model of Hualong One and an estimate net capacity of 1161 MWe.

Pakistan continues to expand its nuclear arsenal with more warheads, more delivery systems, and a growing fissile material production industry.” Bulletin of the Atomic Scientists estimates that Pakistan now has a nuclear weapons stockpile of approximately 165 warheads. “With several new delivery systems in development, four plutonium production reactors, and an expanding uranium enrichment infrastructure, however, Pakistan's stockpile has the potential to increase further over the next 10 years. The size of this projected increase will depend on several factors, including how many nuclear- capable launchers Pakistan plans to deploy, how its nuclear strategy evolves, and how much the Indian nuclear arsenal grows.

He mentioned that during a recent Congressional hearing, Lt Gen Scott Berrier, Director, Defense Intelligence Agency told members of the Senate Armed Services Committee that Pakistan's tense relationship with India will continue to drive its defense policy. He stated Pakistan “perceives nuclear weapons as key to its national survival, given India's nuclear arsenal and conventional force superiority. Pakistan very likely will continue to modernize and expand its nuclear capabilities by conducting training with its deployed weapons and developing new delivery systems in 2022.”Pakistan appears to be investing in short range ‘tactical’ weapons like Nasr and in cruise missiles. It is also working actively on its nuclear submarine program. There is also a need to put more surveillance satellites into orbit.

Dr. Yamin continued that there are fresh challenges to Pakistan's nuclear deterrence that need to be addressed immediately. Merely adding to the nuclear arsenal is not the answer. India is now a member of the so-called Quad that includes the US, Japan and Australia. The heads of government of these four nations met recently in Tokyo and discussed among other things joint strategies for cyber security and a joint space policy. Meant to contain China, this security bloc has implications for Pakistan as well.

A more recent incident that happened recently needs to serve as a wakeup call for our policy planners. On the 9th of March 2022, an Indian supersonic Brahmos cruise missile entered into Pakistani airspace and impacted near the town of MianChanun in Khanewal district. It had left its launch site in Sirsa, Haryana and entered into Pakistani territory via Suratgarh in Rajasthan. The Pakistan Air Defence had picked up a high flying object inside Indian Territory at 6:43 pm. The object suddenly fell into Pakistani territory and travelled 124 km for duration of 4 minutes 44 second before hitting the ground. It caused no human casualties but did damage civilian property.

On May 11, Pakistan Ministry of Foreign Affairs summoned the acting Indian High Commissioner and served a *de marche*. Approximately 48 hour later, around the same time the Indian government admitted that a missile had inadvertently strayed into the Pakistani territory. A day letter Pakistan demanded a joint inquiry. The Indians responded by admonishing the Group Captain and his crew. The US state department called it an honest mistake, while the Chinese demanded stronger action against such irresponsible action. This was the end of the story. In my opinion, he said, there is a method to the madness and the Indians were checking our state of deterrence. A mute response may not help us from preventing such accidents in future.

He concluded by saying that as the state of our economy deteriorates, the deterrence has to be strengthened through other means. The most immediate actions required at the national level are to put our house in order. We cannot sustain a constant state of political instability. The weak and anemic economy needs to be revitalized through patience and hard work. A nation, where a common man is assured of his daily bread can stand up and provide a strong resolve to an enemy, waiting at the gates.



Dr. Zafar Khan (Executive Director, BTTN, Quetta), expressed his views on “*Role of Pakistan’s Nuclear Program in Maintaining Deterrence Stability under Evolving Strategic Environment in South Asia*”. Dr. Khan said that arguably, from the same title one can find out a simple answer that one of the primary aims of Pakistan’s nuclear weapons is to maintain deterrence stability under the evolving strategic

environment in South Asia. In fact, Pakistan has been maintaining deterrence stability while successfully deterring India each day consistently for 24 years since Pakistan tested its nuclear weapon capability on May 28, 1998 twenty-four years ago today in response to India's nuclear tests in the same month and year. He said, it is interesting to note that because of the fear of nuclear weapons use, there has been no major wars for 24 years between India and Pakistan in South Asia while within 24 years from 1947 to 1971, India and Pakistan fought against each other for three times without nuclear weapons. Nuclear weapons could have prevented India and Pakistan to wage war against each other in those 24 years as well.

This historic analogical contextualization of the pre-nuclear 24 years and the post-nuclear 24 years reflect the essence of nuclear weapons while ensuring deterrence stability in South Asia. He said, it is important to know that in the existing literature on nuclear strategy and force posturing, one can find out the common agreement between the leading scholarships that the security factor remains the predominant factor for state's acquisition of nuclear weapons. Even some of the nuclear pessimists such as Scot D. Sagan's widely read and cited article on "Why do states build nuclear weapons?" printed in 1996 in the International Security academic journal primarily emphasizes on the security imperative amongst the other two factors such as the "norms model" and the "domestic model" imperatives.

There could be many other imperatives that entice states to acquire similar capability such as the prestige factor, the technological determinant, the bureaucratic struggle, and the economic advancement. However, safe to say that in international relations, any theoretical perspective that has strong empirical evidence can best be described as a much better and convincing theory. It may be correct to argue that besides security, other factors may also play an important role for a state's acquisition of nuclear weapons. From an academic point of view bearing strong theoretical explanation and convincing empirical evidence, nuclear weapons played a significant role in preventing major wars between nuclear weapons states. For example, although the Soviet Union and the US harshly confronted the Cold War including that of their proxies involved across the globe while bitterly containing each other sphere of influence and despite the danger of miscalculation in using nuclear weapons on numerous occasions such as the 1962 Cuban Missile Crisis, but the nuclear peace prevailed and nuclear weapons prevented major wars between the two. It is because of the value of nuclear deterrence for preventing major

wars amongst the nuclear weapons states, many nuclear weapons states more particularly the established nuclear weapons states are literally not ready for nuclear disarmament in the foreseeable future despite their promises in the Non-proliferation Treaty.

Each nuclear weapons state including that of Pakistan desires to maintain nuclear weapon capability for their ultimate survival. The established nuclear weapons states have been modernizing their nuclear weapons capability adding up for more, incorporating emerging technologies, and modifying their nuclear doctrinal postures against their potential rivals. Most of them reject the ideals of nuclear disarmament. Few of them even do not commonly agree on arms control mechanisms. For example, the US and Russia not only got rid of the Anti-Ballistic Missile (ABM) Treaty in 2002, but also more recently withdrew from Intermediate-Range Nuclear Forces (INF) in 2019 as they keep on developing sophisticated counterforce capability for offensive counterforce targeting where emerging technologies such as cyber, speed, and precision would matter to undermine the deterrent force capability of the rivals. Most of the established nuclear weapons states would use nuclear weapons first except China that pledges not to use nuclear weapons first. The US and Russia possess more than 90% of the world's total number of nuclear weapons. Despite their reduction plan, they still continue to have more nuclear weapons than any other nuclear weapons states.

Dr. Khan continued by saying that all such changes are affecting the policies of smaller nuclear weapons states. For example, Pakistan's nuclear policy is affected by what other nuclear powers do, more particularly by what India has been acquiring and modernizing its deterrent forces. India has been working on both conventional and nuclear forces modernization with increasing the number of warheads most of which are Pakistan's specific. When it comes to South Asian evolving strategic stability, India's increasing strategic partnership with a number of countries such as Israel, France, Russia, and more importantly the US is certainly affecting the deterrence stability of South Asia in general and Pakistan's security in particular. These countries possessing nuclear weapons need to keep the legitimate security concerns of Pakistan into their consideration while dealing and developing their strategic partnership with India. They need to undertake balancing approaches without taking sides in South Asia. In doing so, this could restore strategic stability, which in turn could benefit all the responsible stakeholders having geopolitical and geostrategic interest in South Asia.

The ultimate role of Pakistan's nuclear weapons is not to fight war, but rather to prevent one. It is to maintain deterrence stability and ensure broader strategic stability in South Asia where Pakistan successfully prevents its potential adversary to wage military strikes against Pakistan. Pakistan's credible nuclear weapon capability has already shunned the malign intention of its adversary. Pakistan's nuclear weapons and its related delivery systems are preventing its adversary every day. Pakistan aspires for peaceful uses of nuclear technologies to meet its increasing energy demands. The appropriate uses of nuclear technologies for peaceful purposes not only benefits Pakistan, but also remains cheaper, safe, and reliable. Even if Pakistan develops effective and reliable countermeasures against its adversary, the purpose behind this is to retain balance and prevent war thus again ensuring deterrence stability, which otherwise is undermined by India by increasing and modernizing its deterrent forces both in the conventional and nuclear domain.

Pakistan does not do this. It is a responsible nuclear weapon state. It never misfires its missile across the broader area while endangering the risk of miscalculation. It follows the norms and values related to uses of nuclear technologies for peaceful purposes. It ensures the protection and safeguards of its nuclear forces and its related materials. Unlike India, it has no such record of missing its nuclear related facilities. It follows credible minimum deterrence. Its total nuclear forces are not more than any nuclear weapons states in the world including that of India. It has a robust and centralized command and control system. Its nuclear development program remains India's specific. It follows nuclear ambiguity that suits Pakistan in most of its strategic imperatives. It has a calculated strategy against its potential adversary. It never desires to indulge itself into a bigger and never ending arms race. It retains balance rather than parity. Certainly, it attempts to plug the missing deterrence gap for its own protection and security. It jealously guards the guardians. It ensures the credibility of its deterrent forces in the fast evolving strategic environment of South Asia. It has already proposed India for initiation of a strategic restraint regime in South Asia. It has held a number of nuclear confidence building measures. It also practices nuclear moratorium. Unless India goes for more nuclear tests, Pakistan largely practices restraint in this context.

Pakistan never compromises on its security even if it has to use nuclear forces for its ultimate survival when it is absolutely needed. It responsibly does not intend to use nuclear

forces when it is absolutely not required. It believes that its nuclear forces are credible enough to deter its adversary. It ensures the credibility of its deterrent forces during both peace and crisis time because credibility remains the very essence of nuclear deterrence.

To conclude, Dr. Khan said, Pakistan has a strategy. It reads closely and carefully what its adversary does and why while preparing well itself against the adversary accordingly. Pakistan's nuclear forces are for deterrence purposes. It might never become part of a treaty that remains biased and discriminatory. It favors a restraint regime in South Asia, but it might never become part of arms control and disarmament processes that compromises on its vital security interest. Pakistan should remain a confident nuclear weapon state while possessing nuclear weapons for deterrence purposes ensuring strategic stability in South Asia. It should never indulge into a bigger and never ending arms race. It should produce effective countermeasures while filling the missing gaps. It needs to ensure deterrence credibility by retaining the balance rather than the parity against its adversary. As long as Pakistan's nuclear forces remain credible and capable of being delivered to hit the targets, these forces have considered doing their job.

Ms. Ahyousha Khan(Associate Director, SVI) deliberated on "*Pakistan's Peaceful Uses of Nuclear Energy*". She said that the odyssey of Pakistan's nuclear technology started with the acquaintance of the "Atoms for Peace" program in 1953. Pakistan became one of the early beneficiaries of the program and sent many scientists and experts for training purposes, to get familiar with the aspects of nuclear technology and its use in the peaceful realm. Withering the challenges, Pakistan's peaceful nuclear program is a great success story, encompassing decades of dedication, commitment, and integrated efforts of Pakistan's polity.



Nuclear energy is being used by many states around the world for overcoming energy challenges. It provides a cheaper, reliable, and cleaner source of energy, and is utilized by many states around the world. Pakistan has realized the true potential of the appliance of peaceful aspects of nuclear energy in numerous domains, including health, medicine, and agriculture, the environment, and electricity generation. Pakistan has a long experience of utilizing the potential of nuclear energy for peaceful purposes and is complementing the energy mix of the country.

The energy mix of the country comprises natural gas, coal, hydropower, and nuclear power, respectively. Nuclear energy provides a clean and reliable option, thus Pakistan is increasing its reliance on such cleaner alternatives.

In 1956, the legal framework for the development of nuclear technology got the track with the initiation of the Atomic Energy Research council, which later came to be known as the Pakistan Atomic Energy Commission (PAEC). The first and foremost development in the nuclear arena of Pakistan was the formation of a pool-type research reactor, with the help of the US in 1963, at Pakistan Institute of Science and Technology (PINSTECH), which was under IAEA Safeguards as well. Pakistan also established Pakistan Nuclear Regulatory Authority (PNRA) back in 2001 to further adhere to the international practices of nuclear safety and security. It also provides a regulatory and firm structure to Pakistan's nuclear program. It has taken the guidelines from IAEA and is responsible for ensuring the safety and security of Pakistan's nuclear infrastructure.

Pakistan's marvel in the peaceful application of nuclear technology is recognized at the international level as well, as its nuclear power plants and research reactors are all under IAEA Safeguards. Pakistan has a record of cooperation with IAEA of over fifty years, and consistently shares information with IAEA regarding the crucial activities of the specified plants, and is time and again inspected by IAEA in order to ensure the security and safety of nuclear and radioactive material and to make sure they are well disposed of.

In the peaceful nuclear domain, a formal agreement was signed between Pakistan and Canada to set up Karachi Nuclear Power Plant (KANUPP) in 1962, which started commercial operation in 1972, and is under IAEA. It has a generation capacity of 137MW. In 1986, an agreement was signed with the People's Republic of China for the construction of Nuclear Power Plants, which ultimately led to the construction of Unit-I of Chashma Nuclear Power Generating Station (CNPGS) Chashma-I in 1993, which became operational in 1993. It was followed by the further four operational units, Chashma- II, Chashma-III, and Chashma-IV respectively. All four plants are under IAEA Safeguards.

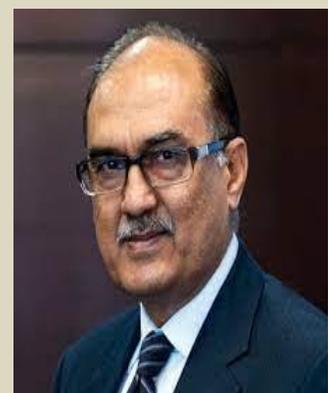
On May 21, 2021, the commercial operation of linked Unit 2 of Karachi Nuclear Power Plant (KANUPP-II) also known as K-2 was formally inaugurated. The plant was linked to the

national grid of the country in March 2021. This is utilized for commercial purposes and will generate electricity of 1,100 MWe. The project has also undergone various safety and security tests before being finally added to the national grid. KANUPP-II has been under IAEA Safeguards since 2017.

In addition to this, the third Unit of Karachi Nuclear Power Plant (KANUPP-III) with a generation capacity of 1100 MWe is also in the final stage. It is expected to be added to the national grid by 2022. Pakistan also intends to construct the fifth Unit of the Chashma Nuclear plant and has planned two more nuclear plants at Muzaffargarh. Pakistan aims to generate 8800 MWe by 2030, which will account for 20% of the total energy mix. Moreover, under the vision 2050, Pakistan has a plan to build 32 Nuclear power plants, which will produce approx. 40,000 MWe. This will ultimately comprise one-fourth of the energy mix of the country.

Ms. Khan said, in an effort to quench the economic woes and energy crisis, it is imperative for Pakistan to continue working on the peaceful application of nuclear technology. The clean history of the utilization of nuclear energy is an indication of Pakistan's commitment towards the utilization of nuclear power for peaceful purposes. Pakistan has proved itself to be a responsible nuclear state and has an impeccable record of maintaining the safety and security of its nuclear infrastructure. Pakistan is a distinguished member of the IAEA and has served in the board of governors twenty-one times and chaired it twice, which shows the recognition of credentials of Pakistan as a responsible nuclear state. Pakistan gives utmost importance to the security of its nuclear infrastructure, and not a single affair of theft of nuclear material has ever taken place.

Lt. Gen Naeem Khalid Lodhi gave his remarks by saying that once a country gain nuclear power, it has to deal with its impact as well, as the fallouts of that development can't be ignored. Moreover, the military advantages gained through the development of such technologies should also be considered. More so, the nature and character of war should be considered, as when you gain nuclear weapons the security paradigm extends to the broader region, which could be in the form of low intensity conflicts or even hybrid warfare.



Hence, the broader scope of the impact of nuclear weapons should also be considered. Furthermore, Gen Lodhi said, these weapons comes in the domain of politico-military weapons, hence the political head of the country should also be trained for exhibiting and expressing the political will of the country by rightly representing the strength and capability a country possess, as their narrative and statements play a crucial role in the communication of deterrent capability to the adversary.

Questions/Answers Session

Ms. Amber Afreen Abid (Research Officer, SVI) asked, considering the biased behavior of international community, what are the diplomatic options for Pakistan's strategic community to counter the effects of this international bent towards India?

Dr. Zafar Khan replied: diplomacy is the first line of defence for Pakistan. The nuclear weapons are there at the top echelon to deter bigger wars and are the top politico-economic weapons. The trend is changing, however, and the politicians and diplomats have to convince the international community that why we have developed these weapons. The diplomatic community has to fight our case not only for the regional deterrence stability but also for the peaceful uses of nuclear energy. Diplomats needs to keep an eagle's eye on what is going in the region and the international domain, and should write and speak about it, so the international community should get a clear message that these weapons are there for deterrence purposes and we need the nuclear technology for peaceful purposes as we are energy starving country, so we need them to overcome our weaknesses.

Mr. Haris Bilal Malik (Researcher, CASS) asked Dr. Tughral Yamin, that Pakistan has been adhering to international practices of nuclear safety and security by following IAEA guidelines. This makes it one of the most committed states that have utilized nuclear technology for peaceful purposes. However, the fact remains, regardless of the fact records, Pakistan has been facing discrimination from the international arrangements on nuclear technology as compared to its regional counterpart. How can Pakistan counter this discrimination?

Dr. Tughral Yamin replied that we as a nation have to work towards the progress of our country, for the uplift of our economy and for building a better image. Unless we do that, we will

always be facing discrimination in the internal system. We should limit our deterrence to India and should work towards the progress of our country and have to uplift our economy if we desire to emerge as a powerful and respected sovereign state on the world map.

Mr. Sarmad Zia (Research Fellow, AIMH) asked what options other than SRBMs are available to Pakistan to keep from escalating any event of conflict with India.

Dr. Zafar Khan replied that considering the nuclear domain, we presume that if there is a deterrence stability that is due to the existence of nuclear weapons, no matter how small number they could be, they play their role in deterrence. As the adversary knows they are credible and could be launched against the adversary if they come up with the military strike or use their nuclear weapons against Pakistan. So, as long we are capable, and credibility of weapons exists, the deterrence by denial exists which is to deter at first place, the deterrence by punishment prevails which is to inform the enemy that if you take any undesirable action, punishment exists for that. The options available include Nasr, which is India specific. We need to plug those gaps by long-range, intermediate range and short range missiles so that there is no gap in deterrence. However, the gaps are still exploited by the enemy, in the form of proxies, in the form of fifth generation warfare, where nuclear weapons can't be used, so we have to come up with the strategies in those domains. Moreover, the political and diplomatic channels should also be utilized to prevent any serious conflict or crisis in the region.

Gen. Lodhi added, that there is an escalation ladder, how things escalate up to its 42 rungs, as Rodney Jones has given the concept, the conflict goes up by passing through several rungs, not directly it goes up. Moreover, there should be policies as to how we have to behave in a certain scenario.

Dr. Nasir Hafeez (Director, SVI) asked: Pakistan managed to develop state of the art nuclear weapons under international sanctions and difficult economic and political circumstances. Today, we are facing extreme political and economic crisis. How can we learn from our experience of developing nuclear weapons and replicate the same model to improve management of our political and economic system?

Gen. Lodhi said, when the scientists of a particular state exhibit their competence, and then it is expected from that country to show progress in the other industrial sectors as well, other than military. So, there is possibility, there is potential and there are high expectations from government to show progress in economy and welfare of its people.

Dr. Zafar said that it is mentioned in the Holy Quran that unless you change yourself, no one is going to change you. So it's about the people of the country, the youth has to play its proper role, the vibrant population has to play the part, we have the money, we have the resources, but it depends how we manage these resources. So, when the nation was committed, all the institutions were committed, on one page to acquire the capability to deter the adversary, and then we were successful. We are a nation of few decades, so the proper management, political stability, law and order situation in the country in collaboration as a nation could do wonders.

In the end, **Dr. Zafar Iqbal Cheema** (/Executive Director, SVI) thanked all the panelists for their comprehensive presentations and for making their distinguished contributions. He also thanked the participants, who have joined the webinar and raised very significant questions.

Media Coverage:

The Coverage of the SVI webinar was reported in print, electronic, and streamed live on social media. The recording is also available on the SVI official YouTube Channel.

1. Face book

<https://fb.watch/do695NUHJb/>

2. SVI-YouTube Channel

<https://www.youtube.com/watch?v=YOEnrfaFdtc>

3. DAWN

https://epaper.dawn.com/DetailNews.php?StoryText=02_06_2022_152_005