



CENTRE for AEROSPACE & SECURITY STUDIES

International Seminar
**GLOBAL STRATEGIC THREAT AND RESPONSE
(GSTAR)**

Seminar Report
March 4-5, 2020



ABOUT CASS

The "Centre for Aerospace & Security Studies" (CASS) is an independent think tank located in Islamabad, Pakistan. CASS aims to provide independent insight and analysis on aerospace and international security issues, of both immediate and long-term concern, from a comprehensive and unique perspective, to inform the discourse of global thinkers, policy-makers, academics, and practitioners through a diverse range of detailed research outputs disseminated through both direct and indirect engagement in a regular and proactive manner.

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CENTRE for AEROSPACE & SECURITY STUDIES

PARTICIPANTS

The conference was attended by over 850 participants including two serving Air Chiefs from Kenya and Ukraine. There were twenty six foreign observers from various countries including UK, Australia, Norway, Turkey, UAE, Saudi Arabia, Qatar, Malaysia, Indonesia, Bahrain, Kenya, Nigeria, and South Africa. Other guests included senior armed forces officials, eminent scholars, and policymakers, members of the diplomatic corps, academia, former ambassadors, bureaucrats and government officials.

Host Centre for Aerospace & Security Studies (CASS)

Chief Guest Dr. Arif Alvi, President of the Islamic Republic of Pakistan

Guest of Honor Makhdoom Shah Mehmood Qureshi, Foreign Minister of Pakistan

Keynote Speakers Ambassador Cameron Munter, Former Ambassador of the USA to Pakistan
Air Chief Marshal Sir Brian Burridge (Retd), CEO Royal Aeronautical Society, UK
Lt General Nasser Khan Janjua (Retd), Former National Security Advisor, Pakistan

Speakers Ambassador Inam-ul-Haq (Retd), Former Foreign Minister, Pakistan
Ambassador Jalil Abbas Jilani (Retd), Former Foreign Secretary Pakistan, Director CASS
Group Captain Lyle Holt, Director Plan Jericho, Royal Australian Air Force
Dr Filippo Neri Leonardo, President Virtualabs, Italy
Col Dr. John Andreas Olsen, Norwegian Defence Attaché UK
Air Vice Marshal Faaiz Amir (Retd), Former VC Air University, Pakistan
Lt General Aamir Riaz (Retd), Former President National Defence University, Pakistan
Mr. Jorge Sebastiao, Chief Technology Officer Huawei Middle East & European Union, Huawei
Air Cdre Simon Edwards, Assistant Chief of Staff Capability Delivery, Royal Air Force, UK
Air Marshal Javaid Ahmed (Retd), VC Air University, Pakistan
General Philippe Steininger (Retd), Military Advisor to the President of CNES, France

INTRODUCTION OF THE SPEAKERS

Chief Guest Dr. Arif Alvi

PRESIDENT OF THE ISLAMIC REPUBLIC OF PAKISTAN

Dr. Arif Alvi was sworn in as the 13th President of the Islamic Republic of Pakistan on 9th September 2018. Dr. Arif Alvi was born in 1949 and completed his early education in Karachi. He did his Bachelor of Dental Surgery (BDS) from De' Montmorency College of Dentistry, Lahore where he was declared the "Best Graduate". He completed his Masters of Science in the field of Prosthodontics from University of Michigan (1975) and in Orthodontics from University of Pacific, San Francisco (1982). He was awarded fellowship 'Diplomatic American Board of Orthodontists (1995).



Air Chief Marshal Kaleem Saadat (Retd)

FORMER CHIEF OF THE AIR STAFF PAKISTAN AIR FORCE, PRESIDENT
CASS

Air Chief Marshal Kaleem Saadat (Retd) is President, Centre for Aerospace & Security Studies (CASS) and former Chief of the Air Staff, Pakistan Air Force. During his service of 38 years, he has held operational, command and staff appointments. He has a Master's degree in Defence and Strategic Studies and is also a graduate of the Ecole Superiore de Guerre Inter Armee (ESGI) and Cours Superiore Inter Armee (CSI) at the Ecole Militaire at Paris, France. He was the member of Directing Staff at Air War College, Pakistan Air Force and Chief Instructor of National Defence Wing of the National Defence College, now called the NDU, Islamabad. He is also Patron-in-Chief of Thinkers Forum Pakistan, of which he had been President and contributing writer for six years. He has also been the Patron of Pakistan Ex- Servicemen Association. He has keen interest in war, peace, airpower employment and development as well as global security and politics.



Ambassador Cameron Munter (Retd)

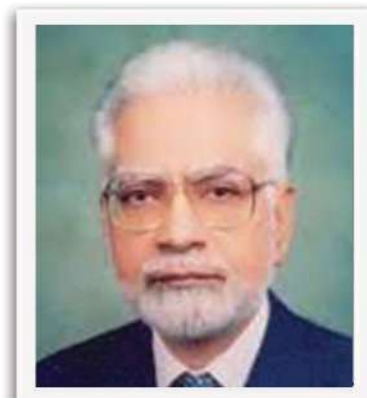
FORMER AMBASSADOR OF THE USA TO PAKISTAN

Ambassador Cameron Munter is a diplomat, academic, and executive who lives in New York. He was U.S. Ambassador to Pakistan from 2010-2012, and to Serbia from 2007-2009. He served twice in Iraq (in Mosul and in Baghdad). In the course of three decades as a career diplomat, he was also NSC Director in the Clinton and Bush White Houses, and served overseas in Warsaw, Prague, and Bonn. After retirement from the diplomatic service, he taught at Columbia Law School and Pomona College. He then became President and CEO of the East West Institute in New York, and there led extensive global track-two mediation efforts. He stepped down from that post in 2019 and now teaches and consults internationally. Amb Munter studied at Cornell and earned a PhD in history from Johns Hopkins. He is a member of the Council on Foreign Relations and the American Academy of Diplomacy, and serves on corporate and non-profit boards around the world.



Ambassador Inam-ul-Haq (Retd) **FORMER FOREIGN MINISTER, PAKISTAN**

Ambassador Inam-ul-Haq (Retd) is a Pakistani career diplomat who has served as Foreign Secretary, the highest post of Ministry of Foreign Affairs in Pakistan as well as the Foreign Minister of Pakistan in the caretaker government of Muhammad Mian Soomro in the year 2007-2008. He also remained Minister of State for Foreign Affairs from June 2002 to November 2002. He served as Pakistan's Ambassador to Turkey, China and Permanent Representative to the United Nations before being appointed as Foreign Secretary. Ambassador Inam-ul-Haq was the Chairman, Board of Governors at Institute of Strategic Studies, a leading strategic studies think tank in Islamabad. He also held the position of Chairman at Pakistan-China Friendship Forum. Ambassador Inam-ul-Haq was the member, Board of Governors at Institute of Regional Studies, Islamabad. Being a seasoned diplomat, he was the Distinguished Visiting Fellow at the premier military institute, the National Defence University Pakistan. He frequently delivers lectures at the National Security Workshops.



Ambassador Jalil Abbas Jilani (Retd) **FORMER FOREIGN SECRETARY AND DIRECTOR CASS**

Ambassador Jalil Abbas Jilani (Retd) is the Director of Foreign Policy at the Centre for Aerospace and Security Studies. He has 38 years of bilateral and multilateral experience as a career diplomat, having served as Pakistan's Ambassador to the United States, Belgium, Luxemburg and the E.U, and Australia. Ambassador Jilani also served as the Foreign Secretary of Pakistan, the top civil service office in the Ministry of Foreign Affairs. A specialist in South Asian affairs, Ambassador Jilani has worked as Director General for South Asia and SAARC, Deputy/Acting High Commissioner to India and Director (India) in the Ministry of Foreign Affairs. In 2018, the Government of Pakistan nominated Ambassador Jilani as member of the Experts and Eminent Persons Group (EEP) of the ASEAN Regional Forum and later in 2019, as member of the Prime Minister's Advisory Council on Foreign Affairs. Most recently, Ambassador Jilani has served as a Senior Fellow at both the International Institute for Strategic Studies (IISS) and the United States Institute of Peace (USIP).



Air Chief Marshal Sir Brian Burridge (Retd) **CEO ROYAL AERONAUTICAL SOCIETY, UK**

Sir Brian Burridge is Chief Executive of the Royal Aeronautical Society. His earlier career included 10 years with Leonardo, a global high-tech manufacturer in the aerospace, defence and technology sectors. During that time, he chaired the innovation hub of the Defence Growth Partnership. Earlier, Sir Brian spent a full career as a pilot in the Royal Air Force holding a front-line command at every level in the Service, including the national joint command in the 2003 Iraq war. He also spent several years in the UK Ministry of Defence in policy posts and left the RAF in 2006 as Commander-in-Chief Strike Command. Sir Brian read physics and electronic engineering at Manchester University and holds an MBA from the Open University and two honorary doctorates. Previously a research fellow at King's College London, he is now a visiting professor at the University of Reading.



Dr Filippo Neri

PRESIDENT VIRTUALABS, ITALY

Dr. Filippo Neri received his Ph.D. in electronics engineering from Rome University, Italy, in 1969. He began working in the mid-1960s with Selenia SpA (now Leonardo), where he became the head of the Tracking Radar Department. Dr. Neri also managed the development of many new radars based on advanced technologies and techniques, including the monopulse tracking antenna, coherent chain TX-RX, and frequency agility. In 1981 he was transferred to the electronic warfare (EW) division as EW systems manager. Since 1985, Dr. Neri has worked for Elettronica SpA in Rome, first as the director of research and new products and later as the technical director, a position in which he promoted the development of the most advanced EW technologies and techniques. In particular, he contributed significantly to the implementation of the solid-state active antenna technology, presently applied both to airborne and naval ECM systems and to the Cross-Eye jamming technique. Dr. Neri has also written many technical articles that have been published by several publications, including the Journal of Electronic Defense, Military Technology, Gulf Defense Magazine, and Difesa Oggi. He is also the author of Introduction to Electronic Defense Systems, First, Second and Third Edition, published by Artech House. Dr. Neri holds many international patents relating to inventions in both the Radar and EW fields. Presently, he is the president of Virtualabs, a company fully dedicated to the Radar and EW Systems innovation where very advanced radar and EW prototypes are realized. He is a life member of the Association of Old Crows (AOC) and teaches radar and EW courses in many countries. Dr. Neri received many awards and recognitions for the work so far done both in Italy (e.g. "Maestro del Lavoro" from Italian President hon. Carlo Azeglio Ciampi and "Commendatore" from Italian President hon. Giorgio Napolitano) and abroad (e.g. induction in the AOC EW Technology Hall of Fame).



Colonel Dr. John Andreas Olsen

NORWEGIAN DEFENCE ATTACHÉ UK & AVIATION SECURITY EXPERT

John Andreas Olsen is a colonel in the Royal Norwegian Air Force, currently the defence attaché to the United Kingdom. His previous assignments include tours as director of security analyses in the Norwegian Ministry of Defence; deputy commander and chief of the NATO Advisory Team at NATO Headquarters, Sarajevo; dean of the Norwegian Defence University; and head of the college's division for strategic studies. He was a visiting professor at the Swedish National Defence University from 2008 to 2019. Olsen is a graduate of the German Command and Staff College and has a doctorate in history and international relations from De Montfort University, a master's degree in contemporary literature from the University of Warwick, and a master's degree in English from the University of Trondheim. Dr. Olsen has lectured worldwide, received several awards and published many books, including Strategic Air Power in Desert Storm (2003); John Warden and the Renaissance of American Air Power (2007); A History of Air Warfare (2010); Global Air Power (2011); Air Commanders (2012); European Air Power (2014); Airpower Reborn (2015); Airpower Applied (2017); and The Routledge Handbook of Air Power (2018).



Group Captain Lyle Holt DIRECTOR PLAN JERICHO, ROYAL AUSTRALIAN AIR FORCE

An F-111 Strike and Flight Test navigator, Lyle's professional joint and interagency experience spans naval aviation; maritime warfare; air combat; air mobility; flight test; electronic warfare; joint effects and manoeuvre; intelligence, surveillance and reconnaissance; command and control; remotely piloted aircraft; air and space defence; support to interagency and special operations. His staff appointments include serving as the Staff Officer to the Vice Chief of the Defence Force. Lyle's operational experience includes: planning and managing Australia's C-130 combat airlift and aero-medical operations; assisting NATO's military support to Afghanistan's 2009 Presidential and Provincial Council Elections; contributing to the planning of multi-national air operations; working in interagency teams to execute domestic operations; and Executive Officer to the Director General Operations, Headquarters Joint Operations Command.



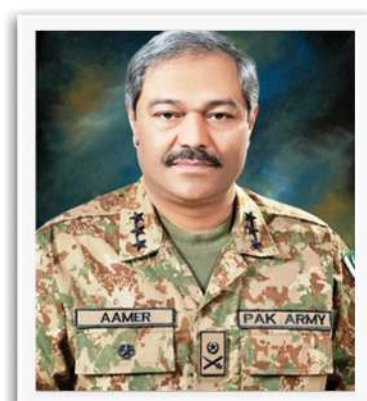
Air Vice Marshal Faaiz Amir (Retd) FORMER VICE CHANCELLOR AIR UNIVERSITY, ISLAMABAD

Air Vice Marshal Faaiz Amir (Retd) has served in Pakistan Air Force (PAF) for over 35 years. He has been a distinguished professional of PAF and commanded the prestigious Combat Commanders School of Pakistan Air Force. He also served as commandant of the National Security College of National Defence University (NDU). He possesses high command and management skills along with the advanced academic background. Most recently, AVM Faaiz Amir (Retd) has also served as the vice chancellor of Air University.



Lieutenant General Aamir Riaz (Retd) FORMER PRESIDENT NATIONAL DEFENCE UNIVERSITY, ISLAMABAD

Lieutenant General Aamir Riaz (Retd) was commissioned in a distinguished battalion of Frontier Force Regiment in 1984. He is a graduate of Command and Staff College, Quetta and National Defence University, Islamabad. In addition, he holds a Masters Degree in Science & War Studies from Quaid-e-Azam University, Islamabad and Diploma in Defence and Strategic Studies from University of Malaya, Malaysia. His varied command, staff and instructional experience includes Brigade Major of Independent Mechanized Brigade Group, Commanding Officer of Frontier Force Regiment, Chief of Staff, Commander Independent Infantry Brigade Group, and General Officer Commanding of a Division and Commander of two different Corps. On the instructional side, he has been on the faculty of School of Infantry and Tactics and Command and Staff College, Quetta. He served as President of National Defence University, Islamabad from December 2018 to October 2019.



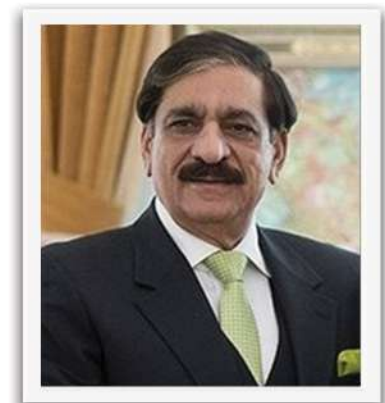
Jorge Sebastiao
CHIEF TECHNOLOGY OFFICER HUAWEI MIDDLE EAST
& EUROPEAN UNION

Jorge Sebastiao is an international ICT speaker, cloud computing, cyber security, blockchain, big data, AI, IoT and ICT innovation professional. He has over 30 years of ICT experience, covering, innovation, architecture as well as risk management, compliance, auditing, certification, business continuity and disaster recovery. He has also served in diverse sectors including telecom, oil and gas, financial, government, defense, healthcare, and education. He develops practical and business focused solutions.



Lieutenant General Nasser Khan Janjua (Retd)
FORMER NATIONAL SECURITY ADVISOR, PAKISTAN

Lt General Nasser Khan Janjua (Retd), is a former National Security Advisor. General was commissioned in 1977 in infantry. In 2007 he was Director General of Military Operations (DGMO), subsequently he was posted as GOC of the 17th Infantry Division. From 2007–08, Major-General Janjua participated in combat operations in Swat and oversaw the Rah-e-Haq in 2007. In 2011, General was appointed as the Chief of General Staff at the GHQ in Rawalpindi. In 2012, General was appointed as the president of the National Defence University where he also served on the teaching faculty and instructed courses on war studies and political science. In 2013, General was commander Southern Command, Quetta. After his retirement from Oct 2015 till June, 2018 he was appointed as National Security Advisor to the PM and served from Oct 2015 to June 2018.



General Philippe Steininger (Retd)
MILITARY ADVISER TO THE PRESIDENT OF CNES
(FRENCH SPACE AGENCY)

Philippe Steininger joined the French air force in 1980. He graduated in 1982 as an engineer in aeronautics and received his wings of fighter pilot in 1984. As a fighter pilot, he participated in several overseas operational engagements in the Middle East, Africa and the Balkans and took the command of a combat squadron. In 1999, he was appointed to the Joint Staff in Paris as the United-States and Canada Desk Officer before joining in 2002 the Armed Forces General Inspectorate. Philippe Steininger was commanding officer of Cazaux Air Base from 2004 to 2007, and later, head of the NATO/EU Branch of the Delegation for Strategic Affairs, French Ministry of Defence, between 2007 and 2009. From 2009 to 2013, he served in Paris in the cabinet of the Secretary General for defence and national security, being charged with preparing the high-level defence committees. Back in the Air force, General Steininger served as deputy commanding officer, then commanding officer, of the Strategic Air Command in charge of nuclear deterrence. In 2015, General Steininger was appointed Deputy Secretary General for defence and national security. In this position, working under the authority of the Prime minister, he was involved in a wide range of defence and security issues. In 2018, he joined the CNES, the french national space agency, as military advisor to the President.



Air Commodore Simon Edwards
ASSISTANT CHIEF OF STAFF CAPABILITY DELIVERY,
ROYAL AIR FORCE, UK

Air Commodore Simon Edwards joined the RAF in 1990. He is a qualified Flying Instructor on the Tucano and Central Flying School trophy holder. Thereafter, he was promoted to Squadron Leader (2001) and posted to Headquarters Strike (now Air) Command, as the desk officer for the RAF's Urgent Operational Requirements. A return to the front line followed, flying C-17 with 99 Squadron at RAF Brize Norton. Promoted to Wing Commander in 2005, he attended the Joint Services Command and Staff College at Shrivenham, completing the advanced course alongside a Master's degree in Defence Studies. He then worked in the Ministry of Defence (2006), within the Directorate of Joint Capability. He was subsequently selected to command 99 Squadron and returned to the C-17 and RAF Brize Norton. During his time in command the Squadron was almost entirely dedicated to the support of UK and Allied forces in Afghanistan, including an unprecedented level of aeromedical evacuation flights. A return to the Ministry of Defence followed, this time as Chief of Staff (Strategy) within the Air Staff. He graduated from the Royal College of Defence Studies, in July 2017 and won the Bon Oeuf trophy. He then worked as a Senior Policy Adviser in the National Security Secretariat before attending the Higher Command and Staff Course at Shrivenham, graduating in April 2018. He has now returned to Air Command on promotion to Air Commodore, as an Assistant Chief of Staff in the Capability area. His responsibilities include Programme Director for the UK Military Flying Training System and the Senior Responsible Owner for the A-400M Airlifter programme.



Air Marshal Javid Ahmed (Retd)
VICE CHANCELLOR AIR UNIVERSITY, ISLAMABAD

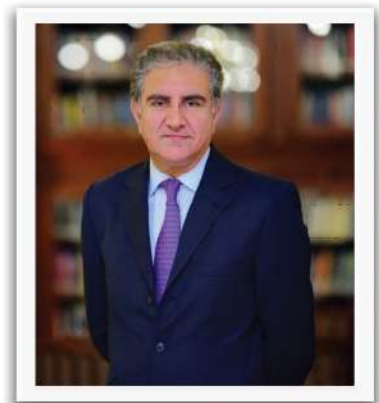
Air Marshal Javid Ahmed (Retd) is presently serving as Vice Chancellor Air University. Previously, he was director 'Policy and Doctrine' at Centre for Aerospace and Security Studies (CASS), Islamabad. He holds a Masters Degree in Defense & Strategic Studies from Air War College (AWC) and a Master's Degree in War Studies from National Defense University (NDU), Islamabad. In his 40 years of commissioned service as a fighter pilot with Pakistan Air force, the Air Marshal flew several fighter aircraft and served in senior command and staff assignments. These include command of the prestigious Combat Commanders School (CCS), an operational Base, Assistant Chief of the Air Staff (Plans), Chief Project Director (CPD) of the JF-17 fighter production program and command of Pakistan Aeronautical Complex (PAC) KAMRA. His specialist areas of research include analysis of aerospace development policies, doctrine formulation and implementation strategies. In recognition of his meritorious services, the Air Marshal has been decorated with Tamgha-i-Imtiaz, Sitara-i-Imtiaz and Hilal-i-Imtiaz (Military).



Makhdoom Shah Mahmood Qureshi

FOREIGN MINISTER OF PAKISTAN

Makhdoom Shah Mahmood Qureshi has twice served as Minister for Foreign Affairs; from 2008 – 2011 and currently, since August 2018. A seasoned politician, Foreign Minister Qureshi has engaged at every echelon of politics and governance since he started his political career in 1983 from the District Council, from where he progressed to the Provincial Assembly. Foreign Minister Qureshi remained a member of the Punjab Assembly for nine years from 1985 to 1993 and has held multiple Ministerial portfolios, serving previously as Minister of Planning and Development and Minister of Finance of Punjab. He has also served as Mayor of the city of Multan from 2000 to 2002 and has been elected 5 times as Member National Assembly from Multan in elections held in 1993, 2002, 2008, 2013 and 2018. Foreign Minister Qureshi has also served as the Minister of State for Parliamentary Affairs in the Federal Cabinet from 1993 to 1996. As Foreign Minister, Shah Mahmood Qureshi envisions a foreign policy that is articulate and principled, ensuring a peaceful and prosperous neighborhood for development. He believes in the reinforcement of long-standing relationships and in making new alliances, with Pakistan pursuing a policy of partnerships for peace, security and prosperity.





CASS Team and Guests



Executive Summary

The CENTRE FOR AEROSPACE AND SECURITY STUDIES, Islamabad held an international seminar titled “Global Strategic Threat and Response” (GSTAR) on March 4-5, 2020 at Islamabad. The seminar was aimed to create a global forum by seeking expert inputs and providing perspective on core areas of research related to the changing balance of power, emerging technologies, aerospace employment, new modes of warfare and evolving force postures.

In his opening remarks, Air Chief Marshal Kaleem Saadat (Retd) talked about the challenges and opportunities of modern times and emphasised that the world was witnessing both the best as well as worst of times. To contextualize the seminar proceedings, he highlighted the emerging challenges faced by the international community that included cyber and aerospace technologies; other disruptive technologies affecting security leading to environmental degradation; and the global tyranny of the rich resulting into inequality. He also highlighted Indian contribution of regional instability through its recent kinetic and non-kinetic actions.



In **The First Session:** “Global Strategic Review,” former US Ambassador Cameron Munter was the keynote speaker, who highlighted three main challenges of the emerging world order that include, climate change, technological revolution and domestic problems of governance. According to him, the old world order seemed to be failing, but the new system had not yet taken shape. In his opinion, Pakistan needed to bring institutional reforms and improve its governance to reap benefits from these transformations.

In the working session, Ambassador Inam-UI-Haq (Retd) said that states were building strategic alliances and new weapons systems to maintain their dominant positions. In the immediate neighbourhood, PM Modi’s internal and external policies were bringing the region to the brink of the region to brink of the war, and the world needed to stop



Panelists of first session of G-Star Deliberate during the Proceedings

following the policy of appeasement towards India for their short term political and commercial interests. Ambassador Jalil Abbas Jilani (Retd) shared his views on global security dynamics and stated that despite acute differences, US, China and Russia would compete and confront at the same time. While suggesting some measures for Pakistan's future strategy, he was of the view that it was in the interest of both the US and Pakistan to maintain good relations that should remain independent of Pak-China relations.



The President of the Islamic Republic of Pakistan, Dr Arif Alvi, who was the Chief Guest, in his address stated that Pakistan understands the value of peace and had been consistently advocating it, which was in sharp contrast to the belligerent designs of India. According to him, the history was witness to the fact that wars were used as tools for exploitation of the resources. Referring to the perilous situation in the Indian Occupied Jammu and Kashmir and the ongoing pogrom against Muslims in India, he said that western interests were swaying the global institutions, where morality and justice seemed to have no place.

The Second Session of the seminar focused on the "Emergent Technology Debate." In his remarks, Sir Brian Burridge explained the challenges of the new technologies, including: AI, robotics, and machine learning, amongst others. In his view, there was a need to look at the future of warfare and

how to set rules for the likely employment of new technologies. Gp Captain Holt talked about emergent technology through the lens of national security and mentioned top ten technology trends of the 2020. According to him, Information and ICT were essential in the contemporary situation. Dr Filippo Neri talked about the weapons of the future, including: hypersonic weapons, laser guns, high power microwaves and stealth fighter jets. According to him, the gap between technologically advanced and technologically dependent countries was narrowing because all nations could use their brain power for technological advancement, which had increased the risk of war. He stressed upon the need to reform the UN and other international bodies to prevent conflict. Dr Olsen in his remarks talked about the future of airpower and emphasized the importance of cyber, AI and space domains. He also highlighted that use of airpower to attain political objectives would be "the new normal".



The Third Session titled as: “The Changing Nature of Future Warfare,” Air Vice Marshal Faaiz Amir (Retd) spoke on the role of aerospace in South Asia and highlighted future challenges, including the weaponization of space and cyber warfare. Referring to the 2019 aerial surgical strikes, AVM Faaiz was of the view that air power had become a weapon of choice in achieving political objectives. According to him, the future threats would not come from WMD but from cyber-attacks. Lt General Amir Riaz (Retd) stated that the hybrid war had posed a dilemma and made war more complex by blurring the lines between military and non-military means. Jorge Sebastio stressed



upon the importance of a good vision to defend oneself. Noting that cyber warfare was a global phenomenon, he emphasized that it was taking place in a regional context. According to him, despite being few in number, the impact of cyber attacks was quite large as they acted against a country's critical assets.



The Fourth Session explored the subject of “Force Posturing for the Future.” Lt General Nasir Janjua (Retd) stated that the Muslim block had the maximum resources and the future of world lay in Afro-Asia with Pakistan as a pivot and having the potential to become a massive hub for future trade. General (Retd) Philippe Steininger discussed the force posturing for industrially independent and dependent countries. According to him, force posturing revolved around three parameters; strategic stature of the country; the level of strategic ambition; and inspirations and objectives of the policies of the state. Air Marshal Javaid Ahmed, while discussing conventional deterrence stated that the PAF had sustained deterrence with ‘Operation Swift Retort’ against Indian aggression, and its future posture would be responsive and aggressive.

The Foreign Minister of Pakistan Shah Mahmood Qureshi was the Chief Guest for the closing ceremony. Talking on Pakistan's vision for peace and stability, he said that Pakistan's geo-political location as a pivot between South and Central Asia and the Middle East and China, was both a blessing and a challenge. He added that Pakistan had been vocal for the rights of Kashmiris and continues to raise voice against the Modi's inhumane and racial policies, both within and outside India.



Session - I

GLOBAL STRATEGIC REVIEW

GLOBAL STRATEGIC REVIEW

Opening Remarks

Air Chief Marshal Kaleem Saadat (Retd)

PRESIDENT CASS



President of the Islamic Republic of Pakistan, Dr. Arif Alvi, Amb Cameron Munter, Amb Inamul Haq, Amb Jalil Abbas Jilani, distinguished guests, Ladies and Gentlemen Assalamo Alaikum and a very good morning!

I welcome you all to this seminar titled Global Strategic Threat and Response.

This is the first international seminar hosted by the Centre for Aerospace and Security Studies or CASS for short. Our think tank was established about 15 months ago, a relatively recent addition to the think tank community in Pakistan. As the name suggests, it is primarily engaged with aerospace and national security matters.

Ladies and Gentlemen, this conference is an attempt to identify issues in the field of aerospace, technology and broader security matters and indicate possible ways forward given the global strategic context. The details of the four main sessions, subjects and speakers are given in the brochure given to you. We are lucky to have experts who have travelled long distances to participate in this event. We are grateful to them for their gracious presence and participation. Those who couldn't come, we will miss them. At the outset, let's take stock of the

global and regional order.

It's evident that the world appears different to different people. For example, the world is a very good place according to the richest one per cent of the global population; not so from the perspective of the remainder 99%. When we look at the global security and development outlook, these are indeed "the best of times and the worst of times." On one hand, we are witnessing marvels of science in the form of ground-breaking research and innovations in the fields of health, industry, space exploration and other emerging technologies. According to a renowned Swedish academic Max Rosling:

- Every day 200,000 people are lifted above the \$2-a-day poverty line!
- Every day 300,000 people get access to electricity and clean water for the first time
- Life expectancy continues to rise
- Child mortality continues to fall
- Fertility rates are falling
- GDP growth rates continue to rise in the developing world
- More people live in democracies
- Great power military conflicts are on the decline

But on the other hand, we are on the verge of sixth mass extinction due to accelerated climate change impacts. Corona virus is a recent threat to the world at large and nobody knows yet, how to tackle it. The destructive potential of current global arms build-up is such that we may see a sudden disruption of the world order caused by an accidental and unanticipated war. The destructive potential of a new scientific development in unleashing new risks to humankind. This is happening in parallel to a persistent erosion of the rule-based system. The unilateral and whimsical actions by the major powers to advance their narrow security agendas are not only eroding the power of the global institutions, but they are also giving way to an anarchic world. Global governance systems are not keeping up with growing interdependencies. Economic coercion is increasingly being used to attain political ends. Political power is increasingly becoming self-serving, gained through financial power, and used for financial gain. The big multi-nationals are becoming more powerful than states. Some thinkers claim we are heading towards a global tyranny of the rich. There are also the problems of global resource depletion, and global inequalities of living standards. It is said that data is the new oil, of which countries like Pakistan have enough but they have not been able to collect, archive, retrieve when required, and exploit it. Old oil needed industrial capacity for pumping, refining and transportation while data exploitation requires vision, foresight, intellect, ingenuity and creativity. An abundance of data needs artificial intelligence for making use of it. That enabler has not yet arrived in most developing countries.



Ladies and gentlemen, there is a strong connection between the global order and its impact on regional security in this age of globalization. This relationship can be positive as well as negative. History remains witness, that whenever the great powers got together for a coordinated effort, they helped in bolstering regional security, for example, the Dayton Peace Agreement for the former Yugoslavia in 1995, the Intermediate-range Nuclear Force (INF) treaty between the US and former Soviet Union (1987-2019), Budapest Memorandum of 1994 leading to nuclear disarmament of Ukraine, and the most recent was the successful conclusion of the Joint Comprehensive Plan of Action with Iran that averted the risk of war in the Middle East. All these agreements contributed to regional peace. But the recent trends are largely negative as the international order is undergoing a transition. This transition, for the most part, is on a downward trajectory. Many of the long-preserved security agreements are falling apart. The INF treaty is already dead, and there is hardly any hope for the renewal of a New START treaty between the US and Russia. The JCPOA has virtually perished after US withdrawal from the agreement and return of sanctions on Iran. A new arms race in conventional as well as the nuclear domain has already begun. Iraq, Syria and Libya are still searching for stability. Today, an added element of risk is the development of new disruptive technologies. The developments in the fields of artificial intelligence (AI), robotics, new materials, information and space technologies as well as the cyberspace are going to change the conduct and theatres of war. This would transform the contemporary concepts of warfare, where conventional forces, as we see them today, may even go out of business in future. But the world is not yet ready to adapt to these new realities. While these new realities are fast emerging, there is literally no consensus on developing new rules to govern them or preserve and upgrade the existing ones. The global powers are busy in accumulating more power with more destructive capabilities and paying no attention to developing new laws and codes of conduct to control this new and multidimensional arms race. The latest divide to afflict the developing world is the technological divide. Lack of tech capability combined with vulnerabilities created by the same have increased the insecurities. Nothing happens without information and computer technology and yet these very systems can have Trojans and spyware installed in them which, instead of making working more efficient, makes it more fragile and vulnerable. During this seminar, we are going to touch upon these issues at length Ladies and gentlemen, Pakistan has not been secure or stable for more than 70 years of its existence. Perennial hostility from India was a consequence of the hurt that it perceived from the event of the partition of the subcontinent in 1947. History is witness that Muslims, under the leadership of Quaid-e-Azam Mohammad Ali Jinnah, wanted to remain within united India, provided their political and civic rights were guaranteed. Since the same were not, demand for Pakistan was made, and the subsequent peaceful political struggle resulted in its creation.

Pakistan is an important player in the global political and security stage but its regional security environment is anything but stable. The British left the Kashmir dispute as their legacy and that has bedeviled the relations between India and Pakistan to this day. The current state of relations with India is at its worst with no hope for stability as the ruling BJP, primed with Hindutva ideology, is thriving on its anti-Pakistan agenda, and continues to radicalize its masses with incessant warmongering. It is alarming to see that even a simple state election campaign in India is run by promising "vengeance" on Pakistan. This is unprecedented and highly egregious. The world must take note of this deteriorating Indian democracy as well as the risks it may pose to the region and the world at large. The Indian government's continuous human rights violation in Kashmir, after the unlawful abrogation of Article 370 of the Indian

Constitution, against the will of Kashmiri people, are adding to the regional instability. Today, Kashmir is under siege for almost seven months with risk of an impending genocide. It's a ticking time bomb and Pakistan has time and again warned the world of growing tensions and its potential spillover effects. Any reaction by the local Kashmiris may be used as a pretext by the Indian government to initiate a war that may expand vertically and horizontally.



We have just marked the first anniversary of Balakot crisis on February 27, where India and Pakistan- the two nuclear armed states- engaged in an aerial dogfight. The air skirmish resulted in shooting down of Indian aircraft by the Pakistan Air Force, which proved its prowess and successfully maintained deterrence by stopping unprovoked Indian aggression.

The PAF responded with responsibility and restraint and maintained air superiority despite India's numerical strength. India's attempts to create a "new normal" were defeated with Pakistan's "quid pro quo plus" response. Through its restrained yet firm response, Pakistan conveyed that it stood ready to respond to any unprovoked aggression from the Indian side. At the same time, it expressed its willingness to engage peacefully and highlighted that war was no solution and every problem would eventually have to be resolved at the table.

Ladies and gentlemen, the significance of Pakistan's location at the crossroads of three strategically important regions of the world -South, Central and West Asia- cannot be understated. In recent months, that significance was well acknowledged as Pakistan was instrumental in facilitating the Afghan peace process and helped to avert an impending crisis in the Middle East by playing a mediator's role between Saudi Arabia and Iran. Previously, Pakistan had always sided with the West- whether it was SEATO, CENTO, the Soviet invasion of Afghanistan or Operation Enduring Freedom. In addition, it has sheltered between two to four million Afghan refugees since 1979, while also consistently contributing troops to UN peace-keeping missions in Europe and Africa. Pakistan has been doing this for 60 years, having sent 200,000 troops to 46 missions in 28 countries. During this activity 157 Pakistani soldiers including 24 officers were martyred. However, the world has not recognized Pakistan's efforts and sacrifices during this considerable and continued security co-operation. Pakistan did get aid and loans in the process but lost its sovereignty without gaining security or stability. It continued to oscillate between the status of a major non-NATO ally and a pariah depending upon the discretion of the West.

In the past two decades, Pakistan has endured grave security challenges as a result of the war on terror; be it growing terrorist attacks inside the country, killing thousands of civilians and members of security forces or the troubled relations with the Eastern as well as the Western neighbours. This war took its toll on the country's economy and losses were in 100s of billions of dollars as a direct and indirect cost of war. People of Pakistan have remained persistent and resilient even in the gravest of situation. Despite these sacrifices, the West kept demanding from Pakistan to do more. This led to mistrust and an adverse effect on mutual relations. The good news, however, is that despite incessant challenges, the country has rebounded. While the governance challenges and economic woes are still persisting, the overall security dynamics have changed dramatically for the better. We eagerly look forward to a stable and predictable future for Pakistan and the region.

In conclusion, ladies and gentlemen, I would like to emphasize that it's about time that the world gave Pakistan its due recognition and saw its potential beyond a narrow "security state" prism. A balance needs to be created between how the West treats India and Pakistan in terms of trade and release of technology. An apparent military imbalance in South Asia is likely to aggravate the instability of the region. If the past is any guide, any time India has any kind of edge over Pakistan, it indulges in chest-thumping and saber-rattling. We saw that in May 1998 and February 2019. The world needs to understand this.

With this, I conclude my remarks and look forward to productive discussions today and tomorrow. I want to thank President Arif Alvi for gracing the occasion and all of you for your attention.

Keynote Speaker

Ambassador Cameron Munter (Retd)

FORMER AMBASSADOR OF THE UNITED STATES TO PAKISTAN EMERGING NEW WORLD ORDER



There are very few countries in the world that do not call themselves democracy. When I was Ambassador in Pakistan, I sent a weekly email to my boss Hillary Clinton and my last email that I wrote predicted that there may be at some point in the future, a war between India and Pakistan, and I said if there is going to be a war between India and Pakistan, it will be over water. This is a question of the infrastructure that people use to try to figure out how you dam rivers, how you deal with the distribution of water? "Now in this new era where the American hegemony is, perhaps less and the Chinese growth is still uncertain. It's a time for Pakistan if it chooses to have an aggressive, and I would say a very creative foreign policy based on its skill, and based on what I hope is the kind of change domestically that will make it a powerful country, because make no mistake, a country with 200 million people and the talent you have should be doing better, and I say this as a friend. What's necessary is a very courageous look in your domestic politics at such issues as your taxing policy.

Fiscal policy is social policy. I think specifically of young entrepreneurs who I know in your country; there are many and they are talented. But they have no political voice or at least they don't have a commensurate political voice the way they should. Mr. Khan is right: you want tourism, not terrorism. And to have that, looking at your state-run industries and the role they have in keeping you strong or holding you back is key. For my friends in Pakistan, the choice really is between a medieval style of politics or a modern style of politics. Do you want to have a state that is a fortress? Or do you want to have a state that reaches out to people around it? This, I see as Pakistan's great opportunity to play a role in key issues. If you can focus on content rather than form, if you can focus on governance, tech and climate rather than the immediate advantage of state-to-state politics or calculation, that I'm afraid has been too much in the front lines, I would say that solving these things is not everything but without addressing things you have nothing.

The last point I want to make is that you can have a constructive, and you must have a constructive relationship with China. It may not seem this way, but China will depend on you as much as you will depend on China. China is in a time of great change. It's going to be the great power that's going to define the 21st century and it's not going to do it simply on its own. China needs friends. China needs friends who have values, like honesty, straightforwardness,

commitment to democracy, commitment to decency and either China reforms without these friends or with these friends. So the Chinese experiment, I would say is not only China's business. It's your business. It's our business. This is why I would call for the Americans to stay engaged with China and why I'm greatly disturbed by the breakdown of American ties with China, but I think all of us should look at this not simply as being on the receiving end of Chinese power but that we too have a role in helping China. To move in the direction that we want to see it move. If we could be honest about that, I think we can move ahead. I would then say we should focus not on textiles, but on tech; not on terrorism but on tourism; and break with the past narratives so that we are dealing with a new world and creating the new world that I mentioned before. Be honest with yourself if you can. Know that you have friends in the United States and I think that Pakistan in the 21st century will get the credit that it deserves.

Ambassador Inam-ul-Haq (Retd)

FORMER FOREIGN MINISTER - REGIONAL SECURITY DYNAMICS



The world is passing through a period of turmoil and transition. The present age has been described by the thinkers and scholars as the age of impunity, uncertainty, disillusionment, anger, disruption and fragmentation and all these phrases are somewhat negative connotations. Liberalism and globalism no longer occupy a central stage. There is an ominous rise of alt-right extremism, ultra-nationalism even xenophobia, authoritarian populism, neo-fascism, majoritarianism, and identity politics based on communalism and islamophobia. Democracy appears to be in retreat in some way and right-wing oligarchs and strong authoritarian leaders have assumed power in major countries. The drivers of this phenomenon perhaps can be traced to the global war on terrorism in the wake of 9/11 and the overt U.S policy of either direct aggression or abetting regime change in Iraq, Afghanistan, Libya, Egypt, Syria and Yemen. This was done under the pretext of removing dictators posing non-existent terrorist threats to the West or seeking to acquire weapons of mass destruction. This was also done under the pretext of democracy, human rights and market economy. This approach over the last two decades has resulted in destruction of the infrastructure, economy, and cultural heritage besides killings of millions of civilians, displacements of huge chunks of the populations and dehumanization of people. The resultant migration to the west from Afghanistan, Syria, Libya and from other places has given rise to the wave of ultra-nationalism in the western countries and the closing of their doors to the migration from these war-ridden countries. Allow me to remind ourselves about the two fundamental principles of international law and interstate relations that over-ride all others notwithstanding our claims of humane international system. The first principle is might is right, and the second principle is possession is the nine-tenth of the law. We can perhaps add the dominion principle of the 'survival of the fittest' to these two principles. In pursuit of these principles, instead of working together to confront the existential threats that I mentioned through cooperation and peaceful existence, powerful states are building strategic alliances and new weapon systems to protect and promote their economic interests and objectives and to maintain their dominant position in the world even if they have to lay waste to the rest of the world and to themselves. Trust and confidence among the nations and in the efficacy of the international forums like the United Nations has eroded greatly in recent decades. Economic sanctions, trade wars and military confrontations are increasingly used as coercive instruments to attain national policy objective. It is in the backdrop of this international environment that we need to look at our own security dynamics in our own region. In

today's interconnected world, it is difficult to place international and regional relations in separate compartments. I will, therefore, talk briefly about the United States, China, India and Pakistan. The symbiotic relationships between United States, China, India and Pakistan drive the regional dynamics particularly in South Asia as well as Pakistan's relations with its neighbours namely Afghanistan, Iran and in the Middle East. You are aware that the United States has never shied away from announcing its determination to maintain full spectrum domination in the world and to not allow any challenger to emerge to its status as the sole superpower of the world. The article in the Foreign Affairs Magazine of 13 February 2020, regarding U.S-China relations contributed by Tarun Chabra, Scott Moore and Dominic Tierney begins with a very frank and telling observation. It states "China's economic rise has disrupted the international system that underpins American security and prosperity". It goes on to say "China presents a formidable threat to American interests for decades to come." We are all aware of the Thucydides trap expounded by Prof. Graham Allison and the need to avoid it. But the U.S so far has responded to China's rise by launching the Indo-Pacific pivot and various other actions to ensure the containment of China. In this emerging equation in our region, China and Pakistan are seen to be in some ways arrayed against U.S and its allies particularly India. Hence, the onslaught against CPEC at highest level in the U.S administration portraying Chinese assistance to developing countries as a debt trap, forgetting conveniently that it is a western world which has created the real debt trap for the developing world.

On India Pakistan relations, it would not be an exaggeration to say that Indo-Pak relations are at their very low ebb today and there are no signs of an early reduction of tensions which are being fuelled by Indian actions and threatening statements at the highest level. The tensions are at peak since the events of 5th August in Jammu and Kashmir and the NRC and CAA have added fuel to this fire. The determination of India to change the demography of Kashmir and major human rights violations of the Muslims and other minorities, there has seen little or no criticism of Indian threat to actions at the official level in human rights lover of the Western world and India remains a strategic partner of the West. The BJP is pursuing policies which could set the region on fire. The international community must exercise under the charter of United Nations to force the Indian government to behave in accordance with the principles and purpose of the UNSC resolutions regarding the future of the Jammu and Kashmir.

Iran is passing through difficult times due to harsh economic sanctions and threats of military actions. Pakistan has been working at diffusing the crisis since Iran is a brotherly neighbour and friend. We will continue our efforts to diffuse tensions between Iran and gulf countries particularly the Kingdom of Saudi Arabia, another close friend of Pakistan, which stood by us in the hour of need. Finally, Afghanistan; the first cracks in the agreement signed on the 29 February 2020 have already appeared with Ashraf Ghani refusing to commit to the release of five thousand Afghan Taliban prisoners, did he not know beforehand that this was part of deal? The Taliban on their part have expressed their determination to press their attacks against the ANF. Let me also add that if United States does indeed withdraw fully in next fourteen months, there is a chance of civil conflict breaking out in Afghanistan between the North and the South, the Taliban against the Tajiks, Hazaras, Uzbeks and Turkmens. Afghanistan could well face the situation similar to one prior to 9/11. The nineteen years of war which left uncounted Afghans maimed, displaced and cost many American lives and an expenditure exceeding a trillion dollars, will be in vain. Pakistan will have to tread with care so as not to be drawn once again into a vortex if such a conflict breaks out, by swift adherence to non-interference in the internal affairs of the neighbouring states. I thank you for your patience.

Ambassador Jalil Abbas Jilani (Retd)-Former Foreign Secretary **DIRECTOR CASS - PAKISTAN'S CHALLENGES AND** **OPPORTUNITIES IN THE EMERGING WORLD ORDER**



Momentous developments are taking place at the global and regional levels. We are witnessing profound transformation in the structure of global order. Any review of the current situation must first acknowledge that despite declining profile, the US will continue to be a great power for decades to come and will exercise effective influence in world affairs. With the changing global landscape, partnerships are also changing. The new order is shaped by increasing level of competition between US vs. China, and US vs. Russia, two countries singled out in the US defence and security review. There is a strong perception that the US primacy in military, technology, economic and political spheres is being challenged. We need to be mindful of the fact that old concepts of power no longer remain valid. Technology, connectivity and trade constitute new elements of power and competition. In our neighbourhood a balanced US policy in respect of Pakistan and India has been

replaced by a visible shift towards India.

However, despite their acute differences, the US, China and Russia will compete and cooperate at the same time to avoid an outright confrontation. Too much is at stake – trade, investments and economic ambitions besides preservation of the current world order. An outright confrontation is also not possible due to limitations imposed by the lethality of nuclear weapons, autonomous weapons as well as forging consensus on global issues of importance such as climate change, non-proliferation, violent extremism etc. which would require a cooperative mechanism. It is interesting to note that interaction between countries have become more complex and contradictory. While we may draw satisfaction from the fact that major wars will be avoided, we need to be worried about the changing nature of doctrines, concepts and technologies. Advances in artificial intelligence, cyber warfare and hybrid warfare could change the dynamics of waging and winning wars. In South Asia, our challenges have increased manifold. In Afghanistan, despite the agreement between the US and Taliban, peace will remain a distant dream due to the internal dynamics in Afghanistan including the current level of polarisation that we see in the wake of the recent political crisis following announcement of election results. An intra-afghan dialogue will remain a huge challenge in a polarised society. Absence of a plan of action for financial sustainability and economic development following the withdrawal of US troops will pose yet another dilemma. In view of the changing global dynamics, no matter from which angle you look at Pakistan, it is at the centre of great power competition because of Indo-Pacific strategy of the US, US-China relations, US-India relations, US-Iran relations, US- Central Asian relations or for that matter the US-Middle East relations. Pakistan enjoys close geographical proximity to all these countries with whom the US has troubled relations. There are several reasons difficulties have risen in our relations with the US. Besides the India factor, the close relationship between China and Pakistan is viewed with suspicion if not hostility amongst the US and the West. While Pakistan's nuclear programme remained under intense scrutiny, in recent years CPEC evokes a lot of criticism motivated by political reasons and not for cogent, rational reasons.

The emerging world order presents both challenges and opportunities for Pakistan:

Firstly, while Pakistan does not have the strategic convergences with the US of the kind it had during the Cold War era and vice versa, it is important for both the US and Pakistan to retain each other's goodwill for the preservation and promotion of their respective vital interests. Prudence demands that Pakistan should continue to seek cooperative relations with the US for the promotion of peace and security in the region including Afghanistan. At the same time we should continue to pursue opportunities for modernization of Pakistan's economy through access to technology, investments and business to business contacts. Pakistan can be a useful economic and trading partner apart from cooperating with Washington on security issues. There is enormous potential for an enhanced economic relationship that has the potential to benefit both. Such an enhanced economic relationship will help the US in improving its image in Pakistan which has been tarnished because of a number of factors including FATF.

Secondly, like the US, China too is pivoting towards Asia and the Middle East and Pakistan remains at the centre of this pivot. For obvious reasons the US is unlikely to present Pakistan with a choice to either join it as part of its



CAS, PAF and foreign guests attending the first session of GSTAR

China containment strategy or align itself completely with China. The US needs enhanced cooperation with Pakistan to resolve Afghanistan, to reduce tension with Iran, to fight transnational terrorists like Al-Qaeda and ISIS, to ensure safety and security of Pakistan's nuclear assets and to bring about peace and stability in South Asia which remain paramount US foreign policy objectives as far as this regions is concerned.

Thirdly, Pakistan's relations with China are as old as Pakistan's relations with the US. Pakistan has done the right thing by not playing one against the other. It has rather played the role of a bridge. In view of the compulsions imposed by the new world order, Pakistan is rightly consolidating its relations with its trusted and all-weather friend China and exploring new avenues of cooperation with Russia. Pakistan-China relations which in the past were confined mostly to strategic and military cooperation have now expanded to close economic cooperation. CPEC is now the bedrock of Pakistan-China ties which has emerged as a game changer for Pakistan, the region and the world. Pakistan is rightly brushing aside objections from India, and the US and pressing ahead with the implementation of phase II of the CPEC. Due to our close and all-weather friendship with China, the US may also need Pakistan to act as a bridge once again in case the current competition transforms into confrontation.

Fourthly, the emerging realities provide an invaluable opportunity for Pakistan to upgrade its relations with Russia. Pakistan and Russia enjoy commonality of views on most regional and global issues. Pakistan's membership of Shanghai cooperation organization enhances the chances of closer security and economic cooperation with Russia based on mutuality of interests.

Fifthly, an astute policy towards the gulf and Middle East in a balanced manner while avoiding becoming part of the conflicts would be in order. Pakistan already enjoys close defence and economic cooperation with most Middle Eastern countries which need to be enhanced.

Sixthly, our continued support to ongoing peace efforts in Afghanistan should continue. A stable Afghanistan will create enormous economic opportunities for the entire region. The challenge however will be the increased Indian involvement following the US withdrawal which may further complicate the situation. India has remained opposed to Taliban-US peace deal and will continue to create hurdles in its implementation. It will also exploit the current political crisis and continue to use Afghan soil to destabilize Afghanistan. Its Afghan policy is not driven by its desire to have peace in Afghanistan but to create challenges for Pakistan.

Lastly, The 5th August Indian move to repeal article 370 and its related provision 35A in violation of the UN Security Council resolutions and Simla agreement has practically closed the prospects of a bilateral dialogue. At the same time, it presented India with the unintended consequence of the dispute having been internationalised once again. The issue had remained dormant at the international level for a long time. The renewed international focus will certainly help Kashmiris realize their aspirations. Peaceful coexistence with India is possible provided India reverses its illegal and unconstitutional move of 5th August, 2019, releases political prisoners, provide political space to the Kashmiris, revive Kashmir related CBMs between India and Pakistan and enter into a meaningful dialogue with Pakistan to achieve a lasting solution of the Kashmir dispute in accordance with Kashmiri wishes. The other option i.e. a confrontation between Indian and Pakistan will have disastrous consequences.

In order to keep pace with the transformed world, Pakistan has no option but to revisit assumptions in the foreign policy domain and revise calculations on a regular basis. Pakistan was able to advance its interests effectively by making an in depth assessment of geopolitical realities. Developing a strong partnership with China while being part of the US led alliance, the 1998 nuclear tests in response to Indian tests, graduating from strategic and military partnership with China to an economic partnership, our decision not to become part of either the Syrian or Yemen wars are some of the examples of the prudent strategy followed by Pakistan. Even in the case of India, despite that country's long held policy to harm and destabilize Pakistan we advocate peaceful resolutions of all disputes. I have no doubt that an in-depth analysis of the current global order is taking place by all stakeholders in Pakistan. The only problem is that we are still at the early stage of a major transition, the contours of which have yet to unfold. The future may present some hard choices to be made by us.

Address by the Chief Guest: Dr. Arif Alvi
PRESIDENT OF THE ISLAMIC REPUBLIC OF PAKISTAN



I have been here listening to the eminent speakers with great interest, at the same time we have been talking about global strategic threat and response in the global order. We also mentioned mature style of politics and I remember a toy and may be some of you won't even remember that, which is called the kaleidoscope. You held it in front of your eyes and twisted it and the pieces of glass inside the toy took up different combinations. Looking at the kaleidoscope and the discussion, it seems that the global order is changing in the same manner.

It disappoints me that humanity refuses to learn, and I have been reading about the history of war for a long time and it keeps on repeating itself. Where do we learn? What do we learn and unlearn. Every generation unlearns what it has learnt. There are new instruments, there are new things, and there is new thinking of how to wage wars. The only change which I see between 18th, 19th, 20th and 21st century is modification of how you wield different weapons and how you wage wars. So, ladies and gentlemen, I want to challenge you to think in a different way; for example, a person starts fighting in this hall for an issue, it will come to a stick, if you have sticks, it will come to guns, and if you have guns how would you react, the learned people, how would you react? You will be ashamed of it. How come that can happen? We know how to avoid that, we know how to have dialogue, we know how to cool down our tempers; but this reaction is here in this hall, and this reaction is in our societies. We have established rules of order; we have established constitution; we have established institutions to implement order within their own countries. Sometimes it fails, as soon as we start looking outside where we consider others as unequal, less literate, and less knowing.

If I again go back and look at the history of the world as far as wars are concerned, it was always to try and exploit resources somewhere, to loot and plunder the storage of toil, loot and plunder what people may have accumulated in their houses and homes, to catch slaves, to arrest women, take them home; that was the history of war, the exploitation and plunder of other regions, the exploitation of the earth, mineral resources, oil for example and that exploitation continues, but the world has changed.

The new world order and new wars are not going to give you peace, which is so elusive. So therefore, ladies and gentlemen, thinkers as prominent as you are leading the destiny of nations, refuse to look at some lateral thinking. If some of you remember the name Edward De Bono who taught about lateral thinking, then dump the present logic somewhere. Restart this logic, be as what you call in computer language 'reset' and the way you think about the new world order. And I would recommend a book, "The New Rules of War" recently published in 2019 by Sean McFate who was teaching at National Defense University and teaches at Georgetown. He mentions the basic principles of war, and mentions George S Patton in 1944 before the D-Day. He says the Americans played to win wars, they have never lost, nor they will ever lose a war, and war, therefore, is like a game to be won but with a lot of benefits. And it has changed over the time. War has been privatized, drug wars, super rich people have people guarding them, drug lords, war lords, rent a mercenary, etc. In fact, the last issue of the economist had an obituary of a mercenary from South Africa. Even mercenaries have been used in recent wars in Iraq and elsewhere.

So, war is not about nationalism of any sort. Wars are about winning, and the destruction created by wars is so evident today. While it was mentioned that poverty levels have reduced but economic disparity has increased. While it was mentioned that there is peace all around, but the entire Muslim world stretching from Afghanistan to Libya has self-destructed and destroyed by other people with different interests. The threat of war and the threat from neighboring countries led us on the track of nuclear weapons and these are called offsets of war. The offset strategy must be there. What is the offset strategy? For example, the gun powder was the medieval times' offset strategy, where it gave strength to people. In the modern era the first offset was nuclear weapons in the 50s. So, countries like ours, in order to secure ourselves, also wanted nuclear weapons. The second offset was precision guided missiles, starting around the 80's, that offset is still continuing. Recently, my friends here from the air force must have known the fact that there is a talk of hypersonic missiles, which will go from any part of the world at the speed of Mach 10 and even Mach 20. Once these are in air, do you have the capacity and institutions to be able to recognize whether it's a false alarm? How should we react to an attack which can happen anytime, it can be accidental, and can even be a nuclear attack. We all remember the situation during the Cuban crises. There was a Russian submarine which got signals of an imminent attack and they debated within two or three minutes and it was the judgment of the captain of the submarine where he was advised by his team to fire but he did not fire a nuclear missile, but it could have happened. So, within the arc if there is a nuclear missile coming in, the ability to recognize whether it is a fake issue, it's a machinery error or it's a real thing then how will you handle it? It can be a very close call today with dwindling global resources. Your home is almost on fire itself from inside. The global resources are limited, and we still tend to ignore that. The real war is that war. You have to throw out the entire chess board and put on another chess board in front of you with the new realities. A book by Noah Hariri, 21 lessons for the 21st century and I believe that the book constructs its argument from the previous book of "Sapiens" and "Homo Deus" and he is also talking about the fact that humankind is threatened due to lack of resources and global warming. And he mentions an interesting argument which is mentioned by other people that DNA in the human mind takes ten thousand years to change but the DNA which is similar to AI can take hours to change. So therefore, the ability of AI to build mankind or even to destroy through instruments created by mankind is tremendous and of course irresponsible. It is ready to give up the leadership of earth and that is the question which has been raised by Mr. Hariri.

Stephen Hawkins in his last book has talked about the same thing, and he was a physicist. But when he talks about the world, he says there is relatively little hope of mankind surviving. But this is a warning to mankind to strategize and to learn and to get out of bind in which it is. These two people, and other people like Jared Diamond who in his book "Upheaval" talks about how nations fought wars by giving picking examples from Finland, Japan, Argentina, Chile and Indonesia. These people have talked about the fact and these are like reconnaissance or recce in military terms. According to Westphalian order, ability to fight wars was with nations only. Individuals cannot fight and should not fight but the nation-state principle has now been overtaken by multinationals in some way. They have the ability to corrupt democracies and that's a different kind of war. So democratic institutions today, the parliaments, the United Nations, are today not geared up to the changing realities.



Q&A Session

Q: As it was mentioned by the speakers that Pakistan needs to break away from its old pattern, what are some of the pre-eminent things that Pakistan needs to do in this regard? Is it the failure of Pakistan's soft power that despite doing our part as a regional player, we are unable to project it in a meaningful way?

Ambassador Inam Ul Haq: Pakistan is definitely breaking out of the patterns of the past and is now seeking to play a role of the mediator or as a peacemaker in the region. However, a country's role as a mediator or a peacemaker is assessed by others in accordance with internal strength of the country, its economic strength and military prowess. If the country is not stable economically, it would suffer from internal instability and problems of governance that would reflect in its efforts to bring about peace in the region. A country which is not at peace with itself in terms of a contented population and a population moving towards economic growth and wellbeing, would hardly go to the world to suggest to them that they should have peace with each other. Secondly, we have had our bilateral problems in the region, until we resolve our bilateral problems, it would be difficult for us to play the role of a mediator in the world.

Q: What are the expectations from the European Union to play a role to meet the challenges of the emerging world order?

Ambassador Inam Ul Haq: When we mention Western World, it includes EU. Additionally, there were two aspects to the European Union and their relationship with the U.S, one is the economic power of the EU which is considerable, and which is needed to be used effectively by the members of the EU to promote their political strength. Additionally, on security matters under NATO, EU meekly follows American line and does not present a separate outlook on international conflicts.

Q: We all point towards good leadership, our ability to be able to elect good leaders and the failures we see around us, we have been in variably and largely blamed for the quality of the leadership at the international level that we ought to see, can you suggest any responses to that challenge?

Ambassador Inam Ul Haq: Electing good leaders is possible only through electoral process. It is because of the emotive issues that reactionary leaders came to power in recent years, the extreme right leaders have come into power or have gained strength in many Western and European countries because of the issue of the migration and the fears that have been created in the Western countries that these migrants will create disorder in the ordered world of Europe. That is why there is a reaction to migration of Syrians, Afghanis, Libyans and others who have been forced to leave their homes. It is for each country to decide what kind of leadership it wants to see controlling its affairs and no foreign country should really interfere in that process.

Q: There is a marked erosion of values in the West and particularly in the United States of America particularly a criminal silence over the situation in Kashmir, this is mainly due to growing influence of Israeli lobby on US politics; do you foresee the ability of this particular lobby to diminish in the future so that justice and morality prevails in the future?

Ambassador Cameroon Munter: We still do believe in these values and I'm proud as an American that we are honest about our mistakes. I agree with you that more should be said about what is happening in Kashmir. There are human rights groups much stronger in the United States than even in Islamabad. I hope in future political debates, Kashmir issue will come up again and the US and its allies would bring attention to these egregious violations of human rights. While I am personally ashamed of the silence of the US Administration on the Kashmir issue, but Pakistan has also avoided raising voice on the Uighur Muslims in China. Pakistan should not ignore its own domestic issues and remain too excited about issues next door. Kashmir is very important but don't lose sight of internal issues. Questions of lobbies in general is serious one in the United States, one that our candidates are discussing and we hope it leads to some real reforms.

Ambassador Jalil Abbas Jilani: On Kashmir issue; India miscalculated and underestimated the response over its action in Kashmir while thinking it will be able to control the situation in a short period. Without realising that the freedom struggle in Kashmir is going on for more than 73 years, even prior to independence, the Kashmiris wanted freedom. In the current situation, Indian image has been greatly tarnished. The Western governments were silent over Indian action due to their strategic reasons, but it is becoming extremely awkward for them to defend India any longer. One such example is UN Human Rights Commission's petition in the Indian Supreme Court.

Session - II

EMERGENT TECHNOLOGY DEBATE

EMERGENT TECHNOLOGY DEBATE

Keynote Speaker: ACM Sir Brian Burrige (Retd) CEO ROYAL AERONAUTICAL SOCIETY



The advances in AI with new network algorithms & machine learning capabilities have begun to play an important role in the modern warfare. During Operation Enduring Freedom, NATO forces were under the process of digitization and workload on commanders in the air operation center was humongous. The six-stage targeting cycle included Find, Fix, Track, Target, Engage & Assess; the first five stages were so cumbersome and time consuming that "Assess" was usually missed out resulting in inefficiency in targeting. In other words, our capacity was absorbed by the first five stages meaning that post-attack target analysis just got lost in the data deluge and we frequently attacked the same targets that were already neutralized and failed to re-attack that weren't. There was no dearth of ISR data but resources to analyze the data were not available. "Economy of Effort" principle of war wouldn't have been compromised had AI with machine learning been available to the commanders at that time. We are already seeing an emergence in the US of AI and machine learning being applied in the new terms to Joint All-Domain Command and Control (JADC2). If a terrestrial sensor in the kill chain is disabled from wherever in whatever form or by whatever means the AI-driven network will pick up other

sensor to fill the gap and this could be anywhere. AI is based on three components i.e. powerful computer hardware, powerful algorithms & ability to process large data sets through machine learning. Machine learning is actually about the study of algorithms and statistical models. AI is becoming ubiquitous reaching into all corners of capability and employment therefore; we need to consider that against the changing nature of conflict. It is equally important to take into consideration the elements of proportionality, humanity, justification and ethics. In technological warfare, it is difficult to find who is using it and how it is being used. In deploying AI against an adversary, plausible deniability is a realistic course of action and the thinking process is needed. Also, operation in the grey zone now presents an attractive theatre and is certainly now a reality. These sub-threshold interventions that are difficult to attribute, hard to detect, and hard to deter range from the dissemination of fake news through application of low-level military violence but they are there every day of the week and they rely heavily on data analytics and artificial intelligence to optimize their effects but also to cover their post-attack fingerprints.

We are in an age where robotics, autonomous systems, big data analysis, artificial intelligence, and machine learning have their roots in commercial technology, commercial research, and commercial developments and are embedded in the military playbook. Because they are commercial systems, their characteristics in terms of accessibility around the globe and proliferation set them apart from the defense technologies that bring its own type of arms race. In these circumstances, we do need to ask ourselves how warfare will look in the future and by what set of rules do we constrain it in the battlespace as well as in terms of proliferation. The military application of AI capability is potentially significant, but the key lies in security from cyber- attacks. One of the most significant advances will be its application in command and control. China is using AI as a tool to leapfrog traditional adversaries who maybe more capable than it. In future, a commander will be presented with an array of predictive outcomes based on the fusion of multi-source intelligence data drawn from the commercial world. The harvesting of all manner of personal data from a variety of sources which would be used to predict customer behaviour. However, in the military, there would still be potential for cognitive confusion and commanders would be expected to determine the optimum course of action based on different predictive scenarios. How a commander can make decisions on this basis? That is where the real cognitive battle will lie, and this is very much at variance with the way we currently teach command, how national doctrines and approaches to mission planning are written. However, humans have to make judgments under the framework of international law.

The Defense Advanced Research Projects Agency (DARPA) in the US is working on program explainable AI to generate an understanding and military confidence in AI systems. At the tactical level, it is certainly possible to see how an AI-driven system could resolve target ambiguity, reduce errors in the complex battlespace, particularly in the urban counterinsurgency. In future learning, a machine would optimize the inputs it wants to use, and it will increase the array of predictive outcomes. There is an important application of AI outside the actual combat that considered, it

need to be considered, it is about training and simulation. There are three drivers at the moment for all of us pushing for more and more training into synthetic environments i.e. cost, realism, and increasingly environmental considerations. Creating the realism on exercises of the complex linear battlespace that we are involved in these days and the unpredictable nature of competence and the intelligence overload frequently is just impossible to reproduce. AI and machine learning can help us in this regard. The big challenge remains how do we make AI acceptable in everyday systems as well as in the military as the two do overlap. We are looking for means to address the tensions that exist in this sort of triangle between the ethics of engineers, public acceptability of such systems and the role of regulator and governance. Later, we concluded that it is the regulator and the government structure that has to be prominent because that will determine the behaviour of the other two groups and there are some good signs. To ensure the sustained and peaceful use of AI, we must encourage public awareness and understanding. War today is an intensely human endeavour. The law of armed conflict requires the application of human judgment both nationally and internationally. We can not allow it to degenerate into being and becoming a legal free zone. Secondly, the threat from a potential adversary is the combination of capability and intent. The latter being the result of the appetite for risk and political will. Machines will help in calibrating the appetite for risk but political will is a human ingredient based on altogether different aspects of human judgment. Thirdly, we can't allow ourselves to become beguiled by advanced technology; the military capability has to pass the relevant test which comes in three parts. In my view, it has to be operationally relevant and it does give you a competitive advantage over your enemy and second is the economic test, is it affordable and value for money and can I procure it without distorting the rest of my equipment program and the funds required to support it? Thirdly, is it politically relevant? Finally, the hardest thing of all is when people are confronted with the latest technology, instead of an automatic, yes, getting them to say why and how much so is emergent technology a force multiplier or a mirage. In my particular view, it's a bit of both and the truth lies somewhere between but only the human mind can determine exactly where to place the cursor.

Dr. Filippo Neri

PRESIDENT VIRTUALAB - WEAPONS OF THE FUTURE



A famous Roman quote says, "If you want peace, prepare for war". These days it can be said, "If you want peace, use brain". With that in mind the discussion will focus on the new high technology weapons, future of the weapons that are much more affordable, nature of global security after the spread of weapons for the future and the gap that will exist between the high-technology countries and the technology dependent countries. All high-power countries are struggling to find the most powerful weapons that should reach the target in a very fast way. That includes hypersonic fighters, hypersonic missiles, electromagnetic gun, laser guns, high-power microwave weapons and stealth fighters. In countries like USA, China, and Russia, there is a huge investment in high-speed aircraft. The aim is always the same; to reach target as soon as possible. However, speed is as important as manoeuvrability. Another important weapon is electromagnetic gun. It means that we have to generate a very

high current in the barrel of the gun so that the magnetic field is generated that moves from the root of the barrel up to the end of the barrel and this magnetic field will move so fast that we launch the projectile at a very high-speed at a very long distance. The distance of projectile will be very long. There are some problems that are still under resolution. First of all, the current that we need to launch the projectile at this very high speed is millions of amperes so the generator must be very big to generate all this power and also the current, so high that the barrel will liquefy. So, we need to implant a very complex, costly and critical cryogenic system to keep the temperature of the barrel at a limit that is useable.

Another technology that is very important is the laser gun. Laser is fantastic because as soon as you have a target on the screen, you can launch a pulse that is some seconds of laser energy and the target is shot down. The laser gun can generate a laser beam with the very narrow divergences of less than 0.1 milli-radian. So, all energy will be focused in one small part of the target. The advantage of this technology is that the cost of one shot of laser gun will cost just one dollar as compared to a missile that will cost four hundred thousand dollars. So, this is the great advantage of these weapons, therefore USA, Russia and China are making efforts in the development of laser gun.

There are several problems to be adjusted, for instance the fire rate. In order to get the power to generate laser beam of 50 to 100 kilowatts or 200 kilowatts of power for some seconds the generator must charge the battery. So, that we can produce this shot of laser gun, but then we require some time before we recharge the battery to make another shot. Thus, firing rate can be a problem. Another problem is that we have to keep the beam at one point, so that the energy that can melt the material of our target at in the same point. For this, the tracking accuracy will be very high and this can be a problem if the target is manoeuvring. Besides, the adversary may also develop some counter measures for laser beam, for example, coating missiles and aircrafts with some mirror because reduction of the laser energy with a mirror can be one hundred to one thousand times less. Another such weapon is stealth aircraft that uses certain material and shape to deflect energy, as a result radar does not receive any signal. High-power microwave is one of the directed energy weapons that can be used from far away to reach the target immediately. A problem that needs to be considered is that when you generate a high-power radiofrequency, the interferences they create can also jam the friendly forces, therefore, use of this high-power microwave is very limited. We also have to consider that for the future we will have some much more affordable weapons, such as the Unmanned Aerial Vehicles (UAV) or Unmanned Aerial Systems (UAS). When you equip a UAV with a weapon this can be a classical bomb but can be a laser gun for the future if combined with a non-nuclear electromagnetic pulse bomb which is very easy to make. If you send the UAV that drops non-nuclear electromagnetic pulse bomb, you can generate this pulse so strong that part of a city can be nullified in the sense that all the electrical things will not work anymore for 10 minutes, 1-2 hours depending on how strong is the electromagnetic pulse.

Space is becoming a place of extreme importance. Space is already crowded with the number of assets that will ensure strategic and tactical communication. Satellites have an alien capability that can locate the position of radars on ground from space. Cyber is another weapon that everybody can utilize because these weapons can be used by any country that has very good capability in software. Everybody can try to inject the virus or to prevent the communication i.e. intra-computer communication. So, this is very important, today, all countries are relying on inter-communication, as everything is connected through computer communication.

Another very important field is electronic warfare (EW). So far EW has been utilized just to intercept and jam radars. In future, however, when one aircraft is looking for the enemy aircraft, it would not require switching on its radar rather it will locate enemy aircraft with high accuracy. An important activity for EW is that future aircraft can have active stealth technology, which means that an aircraft can disappear to any tracking radars in matter of less than the milliseconds. This active stealth means that we have to generate our radar cross-section which will generate a little signal that is the opposite of that, so that our signal will disappear. There are enormous risks attached to these future technological developments. Any country can start a disastrous war by launching an electronic attack or a cyber-attack against the other, or an attack with the UAV. The technological gap between the developed and the developing world is narrowing, thus increasing the possibility of war. To prevent this, we all should empower and reform United Nations organization to restore global security in the future.

Group Captain Lyle Holt
DIRECTOR PLAN JERICO,
ROYAL AUSTRALIAN AIR FORCE - GROWTH OF TECHNOLOGIES



At Plan Jericho -the Royal Australian Air Force's disruptive innovation program- there are top 10 technological trends for 2020. These technological trends include hyper-automation, distributed cloud, AI security, etc. are mostly being delivered between 2020-25 and a couple of them until 2034. At Jericho, these plans are progressing to demonstrate these concepts and to assess their military application. The Plan Jericho envisages to take structured data that comes with solid latitude longitude altitude vector or velocity information tethered to point in time and space that can stitch together with an algorithm to form one coherent picture. Structured data can be used to create a data lake. That data can be used for war fighting as well as administrative function. Likewise, the unstructured data can make a whole range of information available. However, that doesn't come with a set point in space and vector. That data can fit into a national security framework, to enable national security decision makers to

informed decisions on a range of national security matters, including humanitarian support and disaster relief. Using algorithms comes with certain degree of risk, by adding a third piece of predict-and-prescribe in terms of deterministic algorithms, it can be probabilistic. The prescribe and predict algorithms at the moment are very good for telling us what has happened, what it observed, what it detected. But not good at helping us to determine why something happened. However, there are mathematical investigations going on in academia to help us predict and prescribe causal inference to enable us to look at why something happened, and this process enables us to get to a position where we can begin to win without fighting. This is where the power of this sort of concept brings us, firmly into a soft power realm. Eventually one can build enough data to win without fighting. I don't see this as kinetic. I see this as competition. It is not about winning or losing necessarily, It's about prevailing mostly and how we interact with that data. What Plan Jericho is looking at is interacting with battlefield data. But there are gaps and opportunities. We've been able to cluster them into five critical resource areas along these headlines: People, ICT, Ideas, Relationship and Equipment and infrastructure.

We already know this is a people-centric environment. It's about people and their uptake and ability to use this technology. The data-intensive platforms that will absorb the people that we have now, to make sense of that data.



Out of the same people that we need to make sense of, that data is being employed by Microsoft, Google, and Apple etc. It is a finite resource pool out there and we need to make the best of it. If we can save our people a valuable commodity of time, then we should be progressing it. Which means that we will have to retool and reskill some of our people. ICT isn't just an enabler. ICT is essential and it's vulnerable. You need to protect it. Very difficult at the moment to particularly in an Air Force typically led by pilots to recognize that ICT is now actually your neighbour and ICT is now potentially your centre of gravity. The data that you access need to be based on the principles of confidentiality, integrity and availability. To do all this, we need cognitive diversity in our organization. Cognitive diversity is more than gender and race. It is about how we think and how we solve problems.

Regarding ideas, we do have experience in legal and ethical frameworks for new technology, but we will have to evolve them slightly with some of this technology. We need to start thinking like a start-up and not be thinking of traditional military way or traditional national security way. Relationships are critical and bi-directional. It's not just a case of conducting kinetic military operations and tasking intelligence surveillance reconnaissance assets to provide data. The relationship will be more bi-directional, it will be more dynamic. Like the ICT systems, all supporting mechanisms are vulnerable due to its ability to connect with a combat cloud, provide data into the data Lake and use data from the data Lake probably via an App. Due to this disruptive potential, the dynamic of traditional military acquisitions will have to be changed. For example, just acquire the data of sensor instead of an electronic warfare battle management system or an air defense battle management system. To conclude, information and ICT are essential, every organization now works like a tech company resultantly, very high-end and expensive solutions are no more required to prove these concepts.

Col Dr. John Andreas Olsen

NORWEGIAN DEFENCE ATTACHÉ UK - THE FUTURE OF AIR POWER



Air forces all over the world are brilliant when they get to talk about technology, weapon systems and tactics. Air forces all over the world are less comfortable talking about concepts, strategy and theory. We have fourth and fifth generation aircraft, but we are to some extent stuck with first- and second-generation concepts. The future of air power depends on our ability to develop the cognitive domain just as much as the physical. We must move beyond our tactical and technical comfort zone. I will try to do so by answering two basic questions: why and how should we study airpower?

Let us begin with the why. Western airpower has over the last three decades come to play an increasingly important role in national security, international relations and warfare. The historical records of operations Desert Storm (in 1991), Deliberate Force (in 1995), Allied Force (in 1999) and Unified Protector (in 2011) demonstrate that airpower can be the decisive element of military force in an entire campaign.

Airpower took the lead during the major combat phases of operations Enduring Freedom (2001) and Iraqi Freedom (2003), when it contributed strongly to the departure of the Taliban regime and Saddam Hussein's dictatorship. However, the continued operations in Afghanistan and Iraq in the years that followed entailed a different mode of combat; a low-intensity, land-centric counter-insurgency style of warfare in which airpower played an important but a supportive role to ground forces. Airpower has become the 'Western way of war', the 'preferred military choice for political leaders', because it offers the prospect of military victory without large-scale destruction and loss of life. This 'new normal' should not lead to the conclusion that airpower can guarantee success, for two reasons. First, good airpower cannot overcome bad strategy. Second, even modern warfare with first-class intelligence and state-of-the-art technology contains fog, friction, uncertainties and unpleasant surprises. Airpower however powerful, does not offer a universal solution.

The next question is how we should go about. Basic methodology suggests that we should study warfare 'in width, in depth, and in context'. I suggest that we should orient our study in four parts addressing six themes each. The first part covers broad developments, reflecting the width while the second and third parts detail operational depth. The fourth expounds on the wider context in which airpower must be assessed. Students should first explore the relative strengths and unique attributes of airpower. What makes airpower different? Perhaps, most important is the fact airpower allows forces to 'mass without massing': mass, in the sense of an accumulation of a large number of forces in one area, is no longer required to exert a devastating effect upon the opponent. Next, we must appreciate the art of high command and leadership. The biggest challenge for great leaders is contest of ideas as they shape war-winning strategies, concepts and force structures. Entering the Fourth Industrial Revolution, with its emphasis on autonomous and remotely controlled weapon systems, the contest for ideas assumes even greater importance. We also need to understand airpower theory. While familiarity with the ideas of Douhet and Mitchell is important, the modern-day theories of John Boyd, John Warden and David Deptula are more important because their concepts of strategic paralysis and effects-based operations take current technology, recent experiences and the changing character of war into account. Military professionals must also dedicate focused study to the impact of science and technology. Airpower is after all a high-tech profession. Military studies often underestimate the importance of international law and ethics in the conduct of war. A significant body of rules, based on general international humanitarian law, constrains the use of airpower. Legality and legitimacy are topics that are important to understand. We must understand the principles of distinction, military necessity, proportionality and humanity. The politically desirable and technologically possible must never be allowed to trump international law. Air professionals must know their history, the evolution of airpower and its impact on warfare. Regarding the roles and function of the airpower, the first is control of the air: to secure freedom of action in the air, land and maritime domains without effective interference. The second role is strike: the ability to attack with the intention of damaging, neutralising or destroying a target. It is very powerful when applied as part of 'parallel warfare,' in which several aircraft can strike targets simultaneously across an entire theatre with the intent of paralysing and degrading. The third role is intelligence, surveillance and reconnaissance (ISR): to inform tactical, operational and strategic understanding. At the most basic level, this involves getting the right information and intelligence to the right people, in the right format, at the right time.

Being able to strike anything does not mean one should strike everything. The fourth role is air mobility: to move personnel, equipment or forces using airborne platforms to enable manoeuvre and sustainment. The 100-year history of airpower validates airlift as a means of crisis response for both humanitarian relief and military presence. These roles must then be linked to studies of command and control – the crucial enabler to lead an air campaign. Moreover, logistics is a fundamental component of military capability. It enables forces to mount and sustain airpower operations over an extended period. This is essentially the ‘bread and butter’ for mastering airpower. The air professionals must study air-land integration and air-maritime integration to the fullest.

Supplementing the traditional environment-oriented branches, separate studies must address space and cyber operations. Space-based services provide vital enabling capabilities for all of the operating domains. Air-cyber integration involves the application of cyber capabilities to create joint warfighting effects in both the physical and virtual battlespace. Cyber is a ‘wild card’ because it is so difficult to predict its impact and effects, and its true potential has yet to unfold. Air professionals must also understand the relationships between airpower and interagency actors, such as the Red Cross or civilian non-governmental organisations. Such integration is important during a campaign, but even more so as operations transition into the post-war phase focused on establishing a legitimate regime along the principles of good governance, which includes nation building and security sector reform. This is important for ‘winning the peace,’ as opposed to ‘winning the war.’

Finally, the fourth aspect that merits careful attention is the wider strategic context. Military action can be considered successful if, and only if, it helps to achieve the political goals set by national leaders. Air professionals must understand international relations, especially game theory and the art of coercion – deterrence and compellence in the words of Thomas Schelling. It is also important to become familiar with experiences from recent multinational operations. Understanding different political systems, national sensitivities, cultural pride and doctrinal preferences is just as important as the technological interoperability. It is no less important to understand the fourth estate: the press and media. The physical drama and psychological trauma always lend themselves to negative pictures. We must do better to win the battle of the narrative; the truth should not be the first casualty of war. Air professionals must also be able to justify the cost of combat airpower. Both parliamentarians and the public must understand that airpower is worth the investment. The true cost of military equipment must be measured not by unit cost but by the effect an asset has on an opponent. Viewed in this way, even a costly fighter-aircraft can be relatively inexpensive. This insight also applies to the interdependent relationship between industry and airpower. There is a strong linkage between politics, airpower and industry; nations tend to cooperate with and buy material from like-minded nations, which in turn facilitates interoperability.

This model offers a way for how to study airpower in width, in depth and in context. While all 24 themes are important, the combination offers insight to airpower as a political instrument for war and peace. This guide is intended to improve knowledge of aerospace power by covering a range of interdependent themes and interpretations rather than by advocating one specific approach. Airpower is to a large extent about tactics and technology, but a future-minded air service must encourage officers and service members to think innovatively, conceptually and strategically. We need warrior-scholars who dare think new and different, and our air services must reward them for it. The future of air power is just as much about the cognitive as the physical domain.



Q&A Session

Q: How do you integrate start-up while remaining ahead of the curve in terms of AI and other disruptive technologies both in private and public sector?

ACM Sir Brian Burridge: There is some specific narrowing required when we consider that aerospace needs to operate at the start-up level. However, around the world specifically in the US and to a certain extent in Europe, the notion of urban air mobility is taking root. These are autonomous four-seater electrically powered vertical lift air vehicle which assumed the role of attack. Technology is being used to mitigate the risk levels. For example, Boeing and Airbus that are developing those sorts of vehicles in concert with start-ups, who have the technology and could provide the certification. Such partnership is probably the way the modern world would develop.

Group Captain Lyle Halt: There are some large capabilities where you have to follow the full certification process, such as manufacturing of aircraft is one but there are a lot of areas inside of air power where you don't need to interfere with those longer lead time items like new aircraft types. For example, in Australia a young guy thought of developing a small detector for unexploded ordnance. He was facilitated under Plan Jericho to demonstrate his product on a range to show that we can actually do this a different way not risking lives to go and find this ordnance and doing that job a lot faster. So, I think the answer is you need to provide the pathways to people who have really good ideas.

Dr. John Andreas Olsen: It is interesting how an Air Force can work together with industry and computer companies. Challenge is how you get a cultural change within the air force and the military which allows everybody to challenge current doctrines and ideas. Because you may go wrong; then should you be punished or rewarded for thinking out of the box? That's a challenge that most of our air forces struggled with.

Q: Technologies like AI and cyber warfare are bringing a new paradigm and at international level we must have policy development and guidelines from the ethical and moral standpoint because there are many questions that these technologies raise and that would lead us to problems in the near future?

ACM Sir Brian Burridge: In this world there is going to be the ability to take collective action over sanctions and the only way that is going to be united is through the UN. Secondly, on cyber warfare and the ethics on control of it, we agonized over it for five years and ultimately came back to where we started that the law of armed conflict applies. You apply the four tests in terms of impact that your offensive side will have then you will have a legal framework.

Q: What is the applicability and validity of air power against asymmetric adversaries (use in Afghanistan) and in winning the war, or there is need for a different strategy?

Dr. John Andreas Olsen: I think we have to assess Afghanistan on several levels. What is the intention of going in and what air power and military power can and cannot do? Notwithstanding the debate around political success in Afghanistan, to a large extent the military forces achieved the limited objectives they were set to achieve, and when I look at the European partners that contributed to the coalition, they joined in without any knowledge of how to conduct counter-insurgency operations. In hindsight, we adapted to that role quite well. Challenge now is how to defend our own space as we have been out of that role for almost 15 years.

Q: Is there an initiative at the global level to bring new technologies related to artificial intelligence, cyber warfare and hybrid warfare under moral, legal and ethical framework?

Group Captain Lyle Halt: Plan Jericho in conjunction with Defence and Technology Organization and with other large academic institutions was leading the discussion specifically to build some of those base lines.

Q: How emerging economies can benefit from Plan Jericho or the Australian experience?

Group Captain Lyle Halt: We are building this innovation platform and reaching out to different communities who are working on these ideas. We are also creating communities of practice around Australia and at each of major bases where these people could come together and work on problems together to exponentially grow their capability. At strategic and operational level, we are reaching out to technical communities of interest for new and innovative ways of solving problems then connecting those people with various companies, academia, traditional and non-traditional companies, defense companies.

**PRESIDENT OF PAKISTAN AND CHIEF OF THE AIR STAFF
WITH SPEAKERS AND CASS TEAM**





Session - III

THE CHANGING NATURE OF FUTURE WARFARE

THE CHANGING NATURE OF FUTURE WARFARE

Air Vice Marshal Faaiz Amir (Retd)

THE ROLE OF AEROSPACE POWER IN SOUTH ASIA



Airpower remains very relevant in the contemporary battlefield and has not lost its sheen. A number of experts have shared their views on the importance of airpower; for instance, R.P Heame who wrote in his book titled *Aerial Warfare* in 1909 that “aircraft will destroy surprise and therefore destroy strategy”. Similarly, Frederick William Lanchester, in his book *Aircraft in Warfare: The Dawn of the Fourth arm*, wrote “the time will come when the total and irrevocable loss of command to the enemy will be regarded as a disaster of an altogether irreparable decisive kind”. Theorists during the interwar periods termed airpower as a strategic weapon of great flexibility. In post-Vietnam war era, John Warden put forward his 5-ring theory in which he advocated the application of airpower to adversary’s center of gravity in a Clausewitzian style. His 5-ring model consisted of military leadership in the center with military in the outermost circle which advocated targeting all circles simultaneously resulting in physical paralysis of the enemy. This strategy was employed in the invasion of Iraq in 1991 during operation Desert Storm. With the emergence of more technologies such as stealth, the United States had a clear edge in airpower which it utilized in the subsequent conflicts. These missions were the driving force in the application of airpower in all kinds of war. It was in the invasion of Iraq that a fielded army was

defeated by strategic bombing. After 1990s, information dominance has become a focal point of air warfare whereas dissemination of actionable intelligence gathering has emerged as pivotal to success of air operations. Hence, Information and sensors have become the focus of modern warfare. The authors of science of military strategy adhere to the belief that space is the new high ground, whose dominance is imperative to attain superiority within the remaining domains. Space has become a crucial factor in modern warfare and no military should expect to win wars while neglecting space. Satellites as they provide surveillance, reconnaissance, navigation capabilities are becoming critical for warfare.

Coming to South Asia, India envisions itself as a rising global power with world’s 5th largest economy, member of the space club, and being world’s largest importer of arms. Additionally, its border disputes with China and rivalry with Pakistan coupled with the internal strife, increases its sense of vulnerability both externally and internally. India craves hegemony in the region in the new world order and wants to share the table with other global powers such as China, USA and Russia in shaping international affairs. It wants to see a ring of security around it which is not easy to materialize at the moment due to the rising call for separatist movements in India. In order to divert the attention from these movements and at the same time appease its Hindu hardliners, India is on the way of augmenting its capabilities especially in the realm of air power. Forces’ modernization is in full speed with over 450 front line fighter bombers, including Su-30, Mirage 2000, MiG 29 and 36 Rafale on order. Similarly, Israeli Barak 8 and Russian S-400 coupled with Indian indigenous Prithvi Air Defense (PAD) for high level interception and Advanced Air Defense (AAD) for low altitude interception provide a highly defensive shield against incoming missiles, drones and aircraft, but create strategic instability in the region. Similarly, sea, air and land versions of Brahmos supersonic missiles give India capability to target ships on sea and deep targets on land. Furthermore, Indian space program has also emerged as an impressive development and gives it a definite edge over Pakistan.

In future, there would be greater imbalance in the power structure in South Asia with more arrogance in the Indian leadership. In history, reason for war has been misplaced disposition of one’s ability to achieve political objectives through coercion. In future I see the prospects of a conflict with India in the next 18 to 24 months, particularly after the acquisition of the Rafale jets from France. However, this time India would not remain limited to Kashmir while penetrating much deeper and engaging multiple targets. Furthermore, India would be more willing to let a conflict go beyond Kashmir possibly to the international borders.

The future confrontation in South Asia will commence from space and cyber space before transitioning to air space with the possibility to extend its ingress to sea and land. Furthermore, the increasing reliance on aerospace could lead to an era where destruction without occupation becomes a tool for compellence. Pakistan needs to understand the changing political climate in which air power would be employed as it has emerged as a weapon of first choice and the best means to achieve political objectives. The greatest danger which Pakistan faces is not from stand-off weapons but from the cyber-attacks conducted from far off places.

Lieutenant General Aamer Riaz (Retd)

HYBRID WARFARE



Warfare unfortunately is becoming more unpredictable, complex and pervasive. The boundary between military and non-military space is blurring as hackers have the ability to create havoc. The blurring of these boundaries can cripple the financial system of a country. A cyber-attack on a critical facility of a state creates effects. Political engineering and election management in a target state using available technologies are taking place. There have been echoes from United States about Russians using these technologies in their elections. The technologies that are available can create a post-truth and a truth-less environment. The truth becomes irrelevant and the (intention) of this is to shape the behaviour of the people leading to ethnic, religious and social divides. Means are available to fabricate fear and hate, again to shape the environment. The problem with fear and hate is that not only it spreads faster than any virus, but it is also enduring. The use of false flag operations, the use of irregulars and the

use of precision strikes to take out political, military or economic targets are becoming more commonplace.

Man's imagination and technology have assumed a complimentary interplay. Now the dilemma: the situation requires a complete rethink of war. We have come to a time where the rules of war may have to be rewritten. Moreover, without mankind realizing it, the phenomenon of war is becoming more autonomous and the existing state structures are losing control. It may look idealistic, but some wise people need to sit down, break past the barriers of geo-political divide and find a way out for humanity. Otherwise, we are surely on a self-destruct course. The lesser dilemma is on how to name warfare which should give clues regarding its expanse. Among many terms, there are two holistic expressions: One is unrestricted warfare, which emanated from China in 1999, and one of the best expose regarding the nature of war that we are in. The other is the American version and called the hybrid warfare. Unrestricted warfare is how Chinese think about it in theory. In practice, it is a different debate.

Hybrid warfare is where all elements of power are brought to bear on an adversary to modify or shape its behaviour. It is synergetic. Captain B.H Liddleheart would have defined hybrid war in this manner, "It is the synergetic application of direct and indirect strategies". Political, diplomatic, information, propaganda, economic, financial, lawfare and violence through the use of conventional means, and the sub-conventional means are its operating tools. The entire effort is intelligence driven and technology aided. The aim of hybrid warfare is to affect people to shape the behaviour of a state. If that be the case, then the centre of gravity of this war are the people of a target state. It is happening around us. Let's redefine the Clausewitzian triangle. On one side are the political elite and then are the state institutions on the other side of the triangle, and on the third side are the people. Connecting the three nodes of a triangle is the political philosophy on which there is a broad consensus in the state. Second thing which brings all three together is the economic viability of the state. The main effort of hybrid warfare is directed to break the political consensus in a state. The aim is to unravel the political, ethnic and sectarian divide and at the same time hamper its economic viability.

There are 4 case studies: Libya, Syria, Ukraine and Iran. In Libya, the target was the political consensus or the lack thereof, which existed in the society. Economically, it was a viable state. Hybrid war overreached and it gave birth to unintended consequences. This becomes difficult if hybrid war is not calibrated. Its overt aim was regime change, to change the political structure and bring better life for people. However, it hasn't happened and it has overreached in Libya. In Syria, the target was both economic viability and political consensus. Too many actors got involved, too early. Too many unintended consequences were thrown out. People from all across the world got involved - both state as well as non-state actors. The Russians got involved as well. The overt objective was lost.

Then in Ukraine. Crimea fell fast due to Russian ethnic cooperation. However, Ukraine did not fall. It withstood the hybrid war propaganda which was launched against it with the intention of targeting its political philosophy and its economy. The fundamental reason was that US stood behind Ukraine and is still standing behind it.

In Iran, the fundamental target was the economic viability of the state leading to the breakup of the political consensus. This gave birth to too many unintended consequences which were not foreseen by those who were going for a regime change in Iran.

The next important question is regarding the space for hybrid warfare between nuclear belligerents. It reached a point where it could have been very dangerous. Indirect means became more pervasive and direct strategy shrank. There is another aspect, which is regarding the intensity of the hybrid application. The question is: what sort of modification in the behaviour of a state is required? In this anarchic world order, it (hybrid warfare) is applied between both friends and foes. The most dangerous application of hybrid warfare is in South Asia. The means that are being applied against Pakistan include economic and financial ones, socio-economic fissures, terrorism and militancy, political instability and weakening of the institutions. The remedy is that there has to be a strong and broad political consensus within the state. Economic revival alongside maintenance of minimum credible deterrence is necessary. In the external affairs, the positive trajectory that Pakistan has assumed after 15-16 years of its fight against militancy, must be taken further. US-China competition in the region must be converted into cooperation

Mr. Jorge Sebastiao

CHIEF TECHNOLOGY OFFICER HUAWEI MIDDLE EAST & EU CYBER WARFARE



In today's world, it is important to have good vision in order for you to defend yourself correctly. The thing that is important to note is that all this cyber warfare happens in the regional context. Although it's a global phenomenon, in each case, we got some very peculiar issues related to the geography and the neighbouring elements. It's important to understand that, for you to defend and prepare yourselves you need to understand all these dynamics in a clear way. Cyber-attacks are a very small percentage of the kind of attacks that happen on a regular basis. The percentage is in the one percentile. However, despite a very small percentage, the impact can be extremely devastating in the sense that it can go against all critical assets. So, in order for you to be able to defend yourselves and have the right strategy, you need to understand the risks associated with these elements.

When we talk about cyber warfare, one important element is what we sometimes refer to as state-sponsored attack.

When we talk about criminal acts, the objective is primarily to make money, when we talk about state-sponsored attacks the objective is completely different. It's about disrupting the fabric of a country. It's about attacking the economic structure of that country and also political in the more recent ones. If you look at the amount of state-sponsored attacks that have occurred over the last few years, they have increased dramatically. Pakistan is not on the list, but there have been some attacks that go for and against Pakistan. You have been a victim of such attacks. So that means you need to have the necessary preparation to defend yourself effectively.

There are really four major quantifications of cyber-attacks as they exist today. One is what we call nation-state warfare and one example that I'll talk a little bit more in detail is Nitro Zeus, which is an evolution of Stuxnet, which was one of the most lethal cyber attack.

Happening more frequently in the last seven to ten years are political influencers and the impact of social media. When we talk about social media, we mean everything that really appears online digitally. So political influence campaigns have dramatically changed the course and the nature of elections in the world. So, you must be prepared to defend yourselves against the source in order to be effective. Other elements include what's called spying campaigns and there are many of those throughout northern and southern American Hemisphere and more recently in the Middle East. Then, there is nation-state espionage that happens on a regular basis on a very large scale. This has been going on for several years. So, you need to be able to defend yourself correctly and have the right infrastructure and the right procedures to be able to do so. But today the attacks are going after your critical infrastructure. Critical infrastructure are the elements that make the national economy of your country. Take an example of attack against Bahrain that intended to destroy information and targeted specific servers that form the basis to generate the national revenue of the country. One of the major attacks, however, that happened and started this entire debate was known as Stuxnet. Stuxnet was launched against Iran's nuclear enrichment program. It was the first cyber weapon that was put in place and was a sophisticated attack in a sense that involved elements of engineering and programming to hide the attack. The interesting aspect of this attack is; it took six years before it even got discovered.

The counter weapon that came was known as Shamoon. The first one was launched against Saudi Arabia and then against Qatar. Although Shamoon did not affect the production of oil but it did affect the operation of the entire organization. It took something like almost four years for Saudi Arabia to recover from such attack. In the case of Qatar, production did get impacted for about two-and-a-half to three weeks.

We move on to today's world and there's something known as Nitro Zeus, the modern version of the most sophisticated cyber weapon that exists. Although it has not been physically launched, it is ready to be launched whenever the need be, which really means that if there's going to be a major disruption or physical war between those countries, this is the first weapon that is going to be used. It will cause massive disruption inside that country, will stop the banking systems, the telecom systems, the manufacturing systems, the electrical systems and so on. Besides that, one of the important elements today is known as distributed denial of service. Even the most sophisticated countries don't have the capability to defend themselves. It's a very asymmetrical capability. Even very small army can actually cause massive disruption to a country that does not have very big capabilities. Somebody with very limited resources just a little bit of creativity can completely bypass the Investments.

Most countries today like Pakistan have limited financial resources, so they need to design a proper strategy in order to be effective. Most of the systems that are in use today have been built many years ago and there are vulnerabilities in even the best military systems. So, you not really have to just develop the capability to defend the attack, but you also must fix the systems that make you extremely vulnerable. People are going to attack your most important assets. So, you as a country need to look at the critical infrastructure elements that you need to defend. You have to use new technologies that enable you to defend yourselves in a much more effective way. Today, you can buy cyber weapons for as little as zero dollars and as much as a million dollars. There are people that have the knowledge to develop those weapons and they offer it to the country offering the best price. So that means again a very asymmetrical way in the risks that you need to expect.

The game is changing today. Many things have become important like robotics, block-chain, artificial intelligence, quantum computing; and you need to take advantage of these. In today's cyberwar arms race, you can say most countries are spending one to five percent of their traditional military budget. United States is the biggest spender followed by China and a few others. At the end of the day, I want to leave you with the importance of what I call agility. On one side it is good to have a proper attack and a cyber-war capability, but you need to exercise your agility, simulate attacks and defend yourselves in the case of an attack so that you understand how quickly you can restore the services. To finish my presentation just a few important things. Build your capacity based on the budgets that you can afford. It's an asymmetric battlefield so go and grab the best resources available because there are plenty of them. Social networks matter a lot in this battlefield. Agility and attribution matters. Focus on the critical infrastructure of your country, your banking, telecom, electricity, water supplies etc. Then start investing in these new technologies; AI, quantum computing, blockchain, robotics meaning automation, be it software or real robots.

Q&A Session

Q: What would be the impact of induction of new technologies such as S-400 in South Asia and what should be Pakistan's response?

AVM Faaiz Amir: I do not know the institutional response because I am not privy to it, but this is definitely a weapon to reckon with claiming radar ranges of 600 kilometres and shooting ranges of 400 kilometres. But whenever such a weapon is developed, the counter strategies begin to develop. In a country like Pakistan that did not have Beyond Visual Range (BVR) missiles, we have been actually fighting against BVR's in our exercises and working on countermeasures. In addition, when one bloc creates a system, the other blocs start offering counter technologies as well. So at the institutional level, there is work going on this.

Q: There is a 3D warfare against Pakistan i.e. disrupt disorient and dissect; are we prepared against this 3-D warfare? Should we be satisfied, worried or very worried?

Lt. General Aamir Riaz: No country in the world can be completely satisfied, not even the US. We should be worried but not very worried. Our worry should be directed to secure our systems, critical assets and gradually indigenize our systems in four areas i.e. AI, the robotics, the quantum computing and the block-chain systems. Our response lies in having right kind of investment in right areas. We also need to develop a robust society, that's where social science comes into play.

Jorge Sebastiao: In cyber security field, you should be worried because everything changes on day to day basis, and the day you fall asleep, you are finished.

Q: What are the risks of over reliance on artificial intelligence sans adequate cyber control laws?

Jorge Sebastiao: AI is not something new, it's been there for about 40 years. However, what has changed in the past 5-7 years is the availability of low-cost Graphic Processing Unit (GPU) acceleration or Numerical Processing Units (NPU) and extremely low cost of storage. It's the combination of these three or four capabilities that has really created a storm and has enabled AI to come to surface as a useful technology. So, in the past, it was available, but it wasn't commercially viable. For Pakistan, it should not invest time and money in building its own storage technology or to build their own GPUs or NPUs. Let somebody else do that job for you. Rather, Pakistan should focus on developing quality data and the machine learning algorithms and invest in technicians who know how to do that job.

Q: There's a perception that defence related IT equipment come with a backdoor within it; is there an assurance to prove this perception false that this will not be used for any covert operations?

Jorge Sebastiao: Some companies may have such backdoors, but not all. Most of such vulnerabilities are not necessarily by design. Vulnerabilities may get discovered in the systems be it Huawei or Cisco. Many vulnerabilities remain undiscovered for long periods for example "heartbeat" in Linux that remained undiscovered for over 20 years and was discovered by two companies simultaneously through cybersecurity technology known as "Fuzzing." This technique involves providing random data as inputs to a computer program to identify its vulnerabilities. I recommend you to use this technology for critical infrastructure and be certified like its being done in UAE and Saudi Arabia, to discover your system's vulnerability.

Q: Hybrid warfare attacks a state and its society, how do you separate/distinguish a hybrid warfare from a genuine domestic political change taking shape in a society?

Lt. General Aamir Riaz: There are indeed two types of changes; one is rebalancing of the power centres with greater harmony within a state as there are new power centres due to technological and communication shifts in a society. Therefore, there is a natural process of rebalancing within the bounds of the larger political consensus and political philosophy of the state. That is a natural change for example South Africa, after apartheid. Hybrid warfare on the contrary is done through deliberate political engineering to create political polarization by exploiting existing fissures and election processes which cause a long term damage to the political system and society, there has to be a trustworthy institution within the state to control this change.

Q: If there was another conflict with India in the next 18 to 24 months, what should be Pakistan's strategy in this regard?

AVM Faaiz Amir: If the history of subcontinent is analyzed, Pakistan Air Force has had comparative edge over its adversary and the incident of 27th February confirms this assertion. Since the Indian government's action in Kashmir, it has faced a lot of backlash from the Indian media and think tanks, therefore it would try to take on Pakistan as soon as Rafale jets arrive. For Pakistan, it has a number of competent technicians and pilots who will be looking into the matter of how such an engagement would be dealt with.



Session - IV

FORCE POSTURING FOR THE FUTURE

FORCE POSTURING FOR THE FUTURE

Keynote Speaker: Lieutenant General Nasser Khan Janjua (Retd)



Time has come for Pakistan to consider what force posture it should adopt for the future. Force is never in isolation; it is always linked with other elements ingrained within national security. Force not only shapes policies but also serves the policies in both ensuring national security and catering for the futuristic aspirations of a nation. Force posture solely to address an imminent threat serves only a part of its purpose. A vibrant and coherent force must evolve in order to meet the future regional and global threats, and act as an enabler to capitalize on the emerging technologies. For progressive nations, force is not only for the purpose of war; but it remains pertinent during peace times, as the national sovereignty and integrity resides in national progress, which is mandatory for the well-being of the people.

As things stand at this time, large markets, manufacturing hubs, and connectivity networks are present within Asia. Previously, factors such as war economy, political economy, knowledge economy and technological economy were the factors which made superpowers; now these dynamics are in a state of transition. Asia might be a bit late, but progress is bound to reach here. Europe and Asia are already connecting almost 70% of the world population. States such

as Russia have a brighter future connecting with Asia, as the threat from NATO can be mitigated by Russia's inclination towards Asia, which would also draw Europe closer to Asia. Similarly, if connectivity were established between Eurasia and Africa, it would cater for 85.9% of the world population. Pakistan has a very significant position in this regard, as it connects Africa to Eurasia, thereby connecting 85.9% of the global population.

The best region in the world is the Islamic world, and Pakistan is the best country in the Islamic world to assume the responsibility of holding this part of the world together. Pakistan must look beyond CPEC and reach out to Africa, as the future world would be Afro-Eurasian in which Pakistan can act as a connectivity pivot. Pakistan should become a potential industrial hub for which Baluchistan can play a crucial role due to its extensive potentials ranging from plentiful resources to its geostrategic location, which can help carve out four mega cities in Pakistan. However, the true potentials cannot be capitalized until peace finds its way in Afghanistan.

There is a new developing trend in the Asian region where the US is using India as a strategic partner and strengthening India. These developments will create instability in the region. India is indeed importing instability; whereas the US is exporting it. Pakistan is over relying on its nuclear deterrent, whereas India is craving for a limited war with Pakistan with a nuclear overhang on behest of increasing support from the US.

Pakistan is confronted with a two-pronged threat internally and externally. Internally, our adversary is aiming to exploit our vulnerabilities and fault-lines whereas, externally we face threat from the hostile neighbour on the border. Pakistan is a very resilient nation and therefore, we must take timely measures to mitigate the threats posed to us. There should also be improvement in governance and the technological sector. Economic progression should be one of the prime priorities and significant effort should be devoted to adopting a capable foreign policy with respect to Kashmir and Afghanistan.

Pakistan adopted the offensive-defensive strategy until it became a nuclear state, and it served Pakistan well. However, after acquisition of nuclear weapons, the Indian leadership came up with the concept of "limited war" despite being nuclear. Pakistan consented to this doctrine by dismissing the prospects of a full-fledged war, as a limited war was aligned with the capabilities of Pakistan. This was indeed a default acceptance, and the source of emergence of the Cold Start Doctrine (CSD). It was the result of the acceptance of the concept of limited war which precipitated into certain thresholds which defined the level after which a full-fledged war would breakout between the two countries. In order to deal with India's Cold Start Doctrine, Pakistan came up with low yield tactical nuclear weapons. In response to the Indian threat of massive retaliation even in case of use of tactical nuclear weapons, Pakistan came up with the strategy of Full Spectrum Deterrence (FSD).

The concept of a limited war keeps the war alive, as it signals that Pakistan is ready to fight a half-assumed war. Resultantly, both sides leave room to play with deterrence, which leaves ample scope for a war. Pakistan should

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intra-war deterrence and thresholds. Likewise, let Mutually Assured Destruction (MAD) be the new normal instead of a half-assumed war. Pakistan's future force posturing relies on a seamless offensive - defence strategy. It should be signalled to India, that if we cannot be friends let us not be enemies, as we will destroy each other in the process.

General Philippe Steininger (Retd)

FORCE POSTURING FOR INDUSTRIALLY INDEPENDENT AND DEPENDENT COUNTRIES



There are three parameters of force posturing. First is the strategic stature that incorporates political, economic, and industrial dimensions. Politically, a country can be a global power, like the USA or China, a regional power like Brazil, or the leader of a political camp, like the Egypt of Colonel Nasser for the Arab countries back in the 60s, or Iran today for the Shia Muslims. The strategic status of a country gives to it certain political responsibilities which are reflected in its military model. Next, the economic power of a country directly determines its capacity to invest in its defence system, which obviously formats its military. Thirdly, its defence, industrial and technological base directly conditions the level of autonomy in the production of its defence equipment. USA, China, Russia, and France are countries which have the industrial tools enabling them to design and produce for themselves. To implement their defence policy, most of the other countries depend on military supplies from abroad. This

situation undermines their degree of strategic autonomy since they are exposed to supply disruptions and limitations on employment or on export.

The second factor conditioning force posturing is the level of strategic ambition. Regardless of their political stature or economic power, countries display a wide variety of levels of strategic ambition. It can be very modest, or even non-existent as in the case of Costa Rica, a country without an army or a defence budget. Beyond this emblematic case, it has fairly widespread configuration in Western Europe, where some of the rich countries are displaying a low level of strategic ambition. Some figures to clearly put this situation in evidence. In 2019, for example, NATO members spent an average of 1.63 % of their GDP on defence, falling to only 1.55 % when the United States is not considered in the calculation. The richest European country, Germany, spent only 1.36 % of its GDP on defence last year. But the strategic ambition of a country can, on the contrary, be very strong, notwithstanding the modest indicators of economic or military power. We find this discrepancy in North Korea and Iran, for example, two countries that are managing this situation by favouring armaments with a strong strategic dimension at the expense of the overall coherence of their military capability. Pyongyang is developing a nuclear program as well as a ballistic program. As for Iran, without even mentioning the nuclear issue, one can only take note of the highly developed character of its ballistic program and its space ambitions, even though most of its military capabilities remain modest. In both these cases, limited financial resources have led to under financing quite many of the operational capacities in order to focus on a few pieces of equipment with high strategic value that must be produced in total autonomy.

The objectives of a defence policy make the third and last parameter of any force posturing process. Therefore, the third parameter is the orientation of the defence policy. States select objectives for their defence policy which are specific to them. Some countries, above all, seek military power. The most rational option for these countries is to purchase from abroad military equipment off the shelf in quantities as large as possible. Saudi Arabia, which in 2018 spent 8.8 % of its GDP on defence, the equivalent of some \$ 68 billion, falls into this category. This country has equipped its armed forces with an impressive quantity of highly sophisticated military equipment, but its level of strategic autonomy can reasonably be questioned. Israel, whose defence depends very largely on American assistance, is more or less in the same category.

The preservation of strategic autonomy can well be the main objective of a defence policy. For countries making this choice, it leads to implementing an industrial policy favouring the defence sector, to acquire capacity for autonomous assessment of situations, namely strategic intelligence capabilities, and for those countries which are nuclear countries, to maintain their strategic forces at a high standard of credibility. The military superpowers - the USA and China, are obviously in this case, but medium powers, like Russia or France, are also concerned. The defence of

a territory can also be the structuring element of a defence policy. This leads to the development of an essentially defensive military force. Switzerland finds itself in this scenario, with a well-equipped and very efficient military system, but without any capacity for deployment abroad.

Another configuration is of countries whose defence policy is structured by management of local antagonism. This leads them to react according to the "disturbing" neighbour, with a risk of escalation. Such as in the case of France and Germany, two Koreas, China and India, Iran and Saudi Arabia - other examples could be mentioned. In all these cases, significant defence efforts are produced, and the armed forces models are developed to best counter the adversary in the classic logic of the fight between the sword and the shield.

There are various obstacles to the proper force posturing process that include financial, industrial, and political obstacles. With the exception of the two superpowers - the United States and China - and, to a lesser extent, Russia, all countries are confronted with these difficulties to such an extent that they have to look for new ways of developing a suitable model of armed forces. If not, they engage themselves in the dynamics of military regression. Therefore, the question arises of the ways and means likely to provide an appropriate response to these difficulties. These responses can be alliances and partnerships, finding efficient capacities, and adapting trainings. To conclude, there is no single path to success in force posturing, what applies to one country does not necessarily apply to another whose ambitions, means and objectives may be different. With the exception of military superpowers, all countries are facing significant obstacles and challenges in their force posturing process. Therefore, they should consider joining alliances and establishing partnerships; they also have to acquire the most efficient capacities and raise the operational level of their forces to the highest point.

Air Cdre Simon Edward

ASSISTANT CHIEF OF STAFF -RAF - NEXT GENERATION TRAINING



The next generation training can be examined through the lens of the UK Royal military's recent completion of recapitalizing its entire military flying training system as a timely and most updated intervention to the subject matter. The whole journey of RAF revamping its training is explained in terms of updating its previous inventory of training aircraft to the newly modernized fleet by the Prefect replacing the Tutor, Tucano with Texan T-6 and Hawk T-2 seemingly, similar to its predecessor. Apparently, it seems that RAF has spent useless effort, time, and money just having new versions of what it had before, but nothing could be further from the truth. Although these aircraft look quite similar, but actually underneath is a hugely exciting aircraft fleet which is quite different on the inside. So we have an elementary flying training aircraft, i.e. a turboprop, that is powerful and very capable. It has an autopilot and can be flown in airways while the pilots sit side by side. It can do so much more than just elementary flying

training, for instance multi-engine pilot lead training. The Texan T-6 is a hugely advanced aircraft, a whole generation away from the Tucano that it replaced. It is a very capable aircraft which some of the other countries are using to train pilots to go directly to the F-35. Then there is Hawk T-2 that is a generation ahead of the T-1 it has replaced. The Royal Air Force has been very successful with the aircraft in downloading its training from conversion units from the front-line, which has made a real difference. When you learn to fly the Typhoon, the operational conversion unit effectively now starts on the Hawk. The new fine training system that has been put in place is enormously promising and has given us the raw material and room to move forward in the future. We have to ask ourselves what's right, what's next, and what's best for the Royal Air Force. How are we going to train ourselves for the future, for the F-35 and Tempest? 'Tempest' is the future combat air system envisaged for the UK's Royal Air Force. We are growing enormously in the UK's air capabilities. The P-8 has just arrived, and we recognize that not only do we have the challenge to train the pilots for the future, but we also have the challenge to train the rear-crew that we need.

There is also an ongoing process regarding future approaches with the advent of the remote pilot air system cabin, protector, and the I-star systems operator's in that environment. We are going to have a growing number of people; we will determine if they need live flying at all? Additionally, we are going to have an increasing fleet of rotary equipment and an increasing demand on those people to work in evermore challenging circumstances. We are

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building the entirety of our training system to keep up with the next generation of challenges. To deal with that challenge, we have our new Prefect Turbo-prop aircraft. There is no reason why you cannot go from that jet, miss out the T-6, and go straight to the Hawk, and from that straight to Typhoon. Then those who have flown the Tutor can directly go to the Texan, as we did in the 90s. Likewise, in principle, you can skip the Hawk and go straight to the F-35. That is of course a bit of a leap that other countries are doing or considering doing.

While we embrace synthetics, one can use those synthetics to train people, but of course, it doesn't give the experience. It is also important to learn that the next generation will learn very differently from how we have learned and trained ourselves. We may probably have to go for a tailored approach in future, unlike our current training style that is the same for all. With different experiments, we have to develop a system that works better and smarter than what we have today. Like every nation wanting to get the best out of the investment it has made, we too want to make the most use of the raw material in which we have invested. We have Project ASTRA, and at the heart of this project is to ask yourself how we get to the next generation air force. How best to maximize our investments that we have already made.

Air Marshal Javid Ahmed (Retd)

VC AIR UNIVERSITY - ROLE OF PAF IN SUSTAINING DETERRENCE



Pakistan has been at the centre of a regional struggle for security and stability since its independence 72 years ago. At the core lies the lingering legacy of territorial ambiguities left on Pakistan's borders by the British exit, and superpower interest and rivalry in the region, which continues to create uncertainty. A deep analysis of the last half century presents a story of Pakistan's quest for progress in an environment shaped by efforts for political maturity, economic stability, international ambivalence, hybrid warfare and terrorism concerns, and serious challenges to its sovereignty. All along this journey, PAF has played its role silently, with a clear eye on national security, as well as a role in nation building. It has constantly adapted its force posture and development plans to cater for the upcoming challenges, remaining at the forefront to thwart coercive strategies, and playing a vital role in enhancing Pakistan's deterrence potential. The Pulwama episode last year, and its aftermath culminating in a befitting

response by PAF to sustain deterrence by conducting six strikes and shooting down two Indian aircraft - the first manned aerial kill since the PAF shot down the last Russian fighter in 1989 - and creating conditions for a helicopter fratricide is a case in point. Behind this short and precise 30 min action by PAF were years of training and an enviable level of competence and preparation. A force which trained hard and strives to be the best in business. This is not rhetoric for a very professional force which has modestly and reservedly remained at the core of Pakistan's military strategy. Pakistan has remained the epicentre of coercive strategies for decades. Whether it be its nuclear program, support for superpower coalitions, or thwarting regional hegemonic aspirations, it has seen all forms and manifestations of coercion: diplomatic, economic, and military, spread across the physical and psychological domains, applied directly or indirectly, discretely or openly through sanctions, arm-twisting, and outright aggression - the list goes on. These periods of regional turmoil trained PAF well in honing its skills and looking for indigenous solutions. From Soviet-Afghan war to war-on-Terror, PAF's role has been pivotal. Starting in 2004, with operation Al-Mizan began another decade of PAF operations to evict battle hardened criminals and terrorists. Operation Tri Star, Fort Ladha, Falcon Sweep, Rah-e-Haq, Sher-Dil, Rah-e-Rast, Rah-e-Nijat, Zarb-e-Azb, and Raad-ul-Fasaad are a few in the long list of joint operations.

Therefore, synergy amongst all forces and PAFs operational readiness was at its peak when the Indians decided to take on Pakistan last year in February. Pulwama did not come as a surprise. In early February, a CASS study predicted a stage-managed violent incident followed by a limited military action, to garner political support. The study advocating a Quid Pro Quo Plus response was published on 27th morning, the day PAF struck back. As a result, the role of air power as a prime policy tool with strategic effects and its swift escalation aspect were validated. Striking four targets and downing three aircraft by PAF contributed to crossing the Indian humiliation-cum-embarrassment threshold, and caused a near strategic paralysis, forcing a nuclear warning - an aspect missed out in the fog of action and not highlighted by international observers. Pakistan challenged the Indian military myth and escalation

dominance and put a serious dent in its credibility. The red lines and equilibrium were restored in 30 hours. Pakistan's response set a new precedence in the regional calculus in sustaining deterrence.

Even after a year, the risk has not reduced due to growing Indian atrocities in Kashmir. If similar situations arise in the future, Pakistan will respond aggressively every time. It cannot afford not to. It would be naive to assume that Pakistan has no options. Will Pakistan look at novel counter moves? Yes. Closing the airspace alone for Indian airlines would sink Air India, Asia Air, Costa India, Go Air, Jet Konnect, Spice Jet etc. A single counter missile strike in depth would expose all Indian cities even on the Eastern coast and send planners scampering to the drawing boards. In terms of future strategies for the IAF, despite its planned inductions, it would be fatal to cross the borders ever again. PAF is prepared. It could well be Quid Pro Quo Plus Plus next time. Airpower in Pakistan has demonstrated its competence in all dimensions of power projection as exhibited in the resolute defence of its territory against a superpower in the Afghan war, in the COIN-cum-anti terrorist operations during War on Terror, and offensive counter strike in 2019, as well as detection of the Indian submarine at sea last year. However, Pakistan's airpower would have to maintain its advantage to sustain deterrence. This would require investment in the emerging technologies with end-to-end technology controls, such as in AI and counter strike first-shot long-range air-to-air and air-to-surface weaponry with an indigenous blend. The contiguous borders with millions settled on both sides have changed the demographics drastically. As was evident after Pulwama, the suspense to be hit at a time and place of choosing was a nerve-wrecking dilemma for the Indians. If one counter strike was enough to embarrass the Indians, how many rounds will it go this time before they again take out nukes? PAF's force posture over the years has been responsible, mature, and dynamic. PAF doctrinally continues to prepare for the next generation challenges. This seminar is just one such initiative. Future PAF force postures would remain responsive, aggressive, and tech savvy. In time, the Rafale and S-400 would be countered with technology and strategy. Moreover, can a handle full of Rafales and a few batteries of S-400 defend the 3000 km long Indian border and 3.2 million Sq-km area of the entire Indian state?

Almost impossible. To conclude, the use of air to achieve policy objectives has seen a renewed resurgence. Balakot, Swift Retort, shooting of the US drone by Iranians, missile attacks on Saudi oil fields and gulf shipping, killing of an Iranian commander by US drone strike and the heavy use of airpower in Syria are cases in point. For the PAF to maintain an aggressive force posture is a compulsion dictated by the environment on the East defined by erosion of global norms, established principles, muddled strategic thinking, recklessness, and irresponsible behaviour. The Indians need to realize that security cannot be bought by spending another five billion dollars on US arms. It is time for some serious soul searching to give peace a chance. Pakistan stands firm, resolute, and determined to move ahead - slowly but surely. A peaceful country, the resilience and synergy of Pakistan's systems including PAF has been tested repeatedly and have stood the test of time and history. Pakistan's economic and strategic relevance is perpetual, and it needs to be taken in its right perspective. Its role as a progressive developing state with an intent of peaceful coexistence also needs an objective understanding.



Force Posturing
for the Future

Address by the Guest of Honor:

MAKHDOOM SHAH MAHMOOD QURESHI – THE FOREIGN MINISTER OF PAKISTAN



Pakistan's geopolitical location as a pivot between South and Central Asia and the Middle East and China is perhaps both a blessing and a challenge. It is a blessing because it gives Pakistan the salience to contribute meaningfully to stability. It is a challenge because we have to navigate through more than our fair share of geopolitical turbulence. When we took the helm of the government, we resolved:

- (a) That new Pakistan would be credible and courageous, principled and passionate;
- (b) We would neither become part of any conflict nor allow our soil to be used against any other;
- (c) We would seek out and build meaningful substantive outcome oriented partnerships for peace, progress and prosperity;
- (d) We would prioritize economic diplomacy and win-win collaborations for trade and development as a means to achieve enduring stability in Pakistan and the region. These principles have since formed our foreign policy conduct and helped achieve significant breakthroughs.

Pakistan has significantly contributed to the US-Afghan peace dialogue. As part of shared responsibility, Pakistan has played its due role in pushing forward the peace and reconciliation process. It is now for our Afghan brothers to seize the historic opportunity and work out an inclusive political settlement. All through the process, we have also ensured that our regional players, the governments in Kabul, Afghanistan's neighbours and important capitals remain cognizant of our efforts. For the last forty years, Pakistan has been hosting what has been labelled by the UN Secretary General as the most protracted refugee situation in recorded history. It is a measure of success of our efforts that today Pakistan is seen as part of the solution and not of the problem.

Our national action plan is the consensual blueprint of eradicating terrorism. Operations Rad-ul-Fasaad and Zarb-e-Azb have been resounding successes. 2019 has been the safest year yet. It is also the year we have opened up to the world with our revamped visa on arrival and online visa initiatives. This has paved the way for Pakistan's journey from a country known for terrorism to one known for tourism. Despite the ongoing dire situation in the occupied Jammu and Kashmir and the current slide in Pakistan-India relations, Pakistan established the Kartarpur Corridor to allow our Sikh brethren from India and around the world access to one of their holiest sites on the occasion of 550th birth anniversary of the founder of Sikh religion, Baba Guru Nanak. The Kartarpur spirit animated our actions and is a living testament to Pakistan's vision for the region and Pakistan-India relations.

Pakistan in its modest capacity has contributed to lessening tensions and the threat of war and promoting dialogue and diplomacy in the Middle East. We have unequivocally declared that we would not take part in any regional conflict and that we would only be partners for peace. We have been at the forefront in declaring that conflict would be in no one's interest and have repeatedly called for restraint and recourse to dialogue and diplomacy.

A year ago, India violated our airspace on a false pretext with a sinister design. The challenge before our leadership was to prevent a war that could be disastrous for the region while ensuring that the Indian aggression did not go unpunished. We were able to achieve both objectives. It was Pakistan's maturity, responsibility and restraint but also a firm resolve to respond to naked aggression. We have since seen India take a number of steps to further aggravate the situation in Indian occupied Jammu and Kashmir and indeed in India itself. Mobilized by the Hindutva driven agenda, racial supremacy, and hatred against Muslims, the RSS inspired BJP government has moved on to take further unilateral and illegal steps in the Indian occupied Jammu and Kashmir.

The unprecedented lockdown has continued beyond six months. The Citizen Amendment Act (CAA) and the National Register of Citizens are aimed at disenfranchising India's 200 Indian Muslims. As was predicted by Prime Minister Imran Khan, Modi government's policies are taking a bloody and dangerous turn. The pogrom of Gujarat is being replayed on the streets of Delhi. This is a matter of deep concern to Pakistan and should be to the entire world. Hindutva and its capture of Indian state institutions poses the single gravest threat to global and regional peace and security.



Pakistan has not sought conflict with India, but we have not appeased either. We have not shied away from lending our full voice and support to the beleaguered people of Indian occupied Jammu and Kashmir. We have not shied away from exposing the real Indian Intent and agenda to the world. Today even after decades, the Kashmir issue is fully alive and internationalized. The world opinion is clearly turning in favour of the Kashmiris and against ruling Hindu supremacists. India is facing international scrutiny and opprobrium like never before. 'Incredible India' today is being viewed as 'Intolerant India' and 'Shining India' as 'Burning India'. We have no doubt that the world community would clearly see the BJP government in India for what it is -an ideologically driven hate filled majoritarian clique that is destroying the societal fabric and deeply hurting minorities, especially Muslims.

Pakistan has sought and strengthened partnerships with international and regional friends. Pakistan's relations today stand at a qualitatively higher plane. We have imbued these partnerships with the greatest sense of direction and deeper economic content. Under the engage Africa initiative, we are opening up fresh avenues for economic diplomacy and win-win collaboration with our African friends. And with the restoration of peace in Afghanistan, connectivity with Central Asia will be given greater impetus. Launch of the next phase of China-Pakistan-Economic Corridor, the next generation Pakistan China Free trade agreement, the strategic engagement plan with the European Union, the planned 20 billion dollar investment by Saudi Arabia and the strategic economic framework with Turkey are just a few of the tangible outcomes. We have leveraged our partnerships to champion causes that impact the developing world.

Pakistan has been at the forefront in the fight against climate change, Islamophobia and eradicating corruption. We have vociferously stood up for defending Islam and the rise of Muslims and in calling out Islamophobia as racism and crime. We are playing our role in ensuring multilateralism in the UN's system and contributing actively to reforms at the UN that would see the emergence of a more democratic, more equal, and more effective world body. Perhaps there could be no bigger tribute to Pakistan's contribution to global peace and security than what the UN Secretary General had to say about Pakistani blue helmets. Speaking about Pakistani peacekeeping, he lauded the professionalism and contribution of our brave men and women. One hundred fifty thousand of whom have been deployed to 41 peacekeeping missions in 23 countries, and 157 have made the ultimate sacrifice. He declared Pakistan a leader in championing women peacekeepers, and an example to others. He said and I quote that Pakistan is one of the most consistent and reliable contributors to peace efforts around the world. In another context, he said that he had a love affair with Pakistan and its people.

Q&A Session

Q: What are your thoughts on the evolving role of airpower in hybrid warfare especially in the context of space militarization?

General Philippe Steininger: I don't really like the term hybrid warfare. However, warfare in general comes with a wide range of intensity. Air Power can play a role in whole spectrum from low intensity configuration to the highest intensity. It can play the role both in tactical field and the strategic field. Air power can play a role in a lot of different missions from ISR to strategic strike to support of land campaign and support of air transport.

Air Marshal Javaid Ahmad: The airpower played a big role in hybrid warfare. For example, in Syria and Afghanistan. The weapons systems and the air power developed in Afghanistan had led to the maturity of the unmanned systems. Likewise, in Syria unmanned vehicles played a significant role in hybrid warfare.

Q: The industrially independent countries usually make military technologies that are more efficient in total war scenario whereas industrially dependent countries are facing sub conventional war threats. Should industry develop accordingly?

General Philippe Steininger: I don't think the industry has to be dependent on nature of warfare. It is difficult to know exactly which type of war a country might face and set up an industry or develop a force posture accordingly. The real question for a country is if it wanted to be strategically independent or not. For example, Caracalla decree of Roman Empire. But many Western European countries are abandoning the idea of strategic autonomy and are depending on the US for security; hence they are not keen on developing their own industry in different sectors.

Q: What are the risks of potential information overflow for the pilots in the technologically advanced countries that would go beyond the scope of the mission?

Air Cdre Simon Edward: Currently available training system for frontline is likely to be insufficient for the next generation aircraft. This is one of the primary aims to address the ever growing gap between the training fleets and frontline fleet in Britain. The challenge is how to make most of what you have, how to leverage it. We recognize that the general principle is that you should take the pressure off the frontline training and put it on to your training system. There is always going to be the management of the interface between phase 2 training and phase 3 training i.e. operational conversion unit. In this regard, it is ok to ask yourself questions such as should we download that aspect of our operational mission to our training system or do we just need to bite the bullet and hold it on the frontline.

Q: What is the importance of Afro-Eurasia and its linkage with peace in Afghanistan?

Lt. General Nasir Khan Janjua: I envision Afro-Eurasia as a future possibility and that peace in Afghanistan would have a substantial impact on it. Connectivity in the whole region is a requirement of economic progress in which Afghanistan will remain a barrier. However, with prospects of peace in the future, economic progression can make its way in the region.

Q: What is the possibility of a peaceful coexistence with India in view of its current government's aggressive policies?

Lt. General Nasir Khan Janjua: Notwithstanding Indian aggression, Pakistan must continue to work for a peaceful coexistence. There is already resentment within India against the government and it will learn its lessons. There are leaders who are sane and leaders who are not. However, this shouldn't dictate our response and therefore, there should always be room for co-existence despite the fact that India has taken the course that is self-destructive. Pakistan is a peace-loving nation and takes a responsible attitude. International community will always be fearing the nuclear weapons falling in the hands of terrorists despite the fact that we have killed such narrative. Therefore, Pakistan doesn't need to profess for war and should conduct itself as a mature state.

**PAKISTAN'S FOREIGN MINISTER AND
CHIEF OF THE AIR STAFF WITH SPEAKERS AND CASS TEAM**



KEY TAKEAWAYS

- The unilateral actions by the major powers to advance their narrow security agendas are eroding the credibility of the global institutions and giving way to a more anarchic world, which could bring new challenges for Pakistan.
- In the past seven decades Pakistan has always supported western alliances and coalitions and sacrificed, yet it doesn't get the credit for the same.
- Climate change, technological revolution and domestic governance - are the three main challenges of the emerging world order for which Pakistan may have to prepare itself by focusing on high end technologies and by developing innovative solutions for the emerging problems, besides improving its governance.
- Pakistan's concerns on Kashmir issue are being heard, but there are moral questions on its silence in support of Muslim Uighurs in China. Pakistan, therefore, needs to find ways to maintain a principled stance on the humanitarian violations.
- The new world order is being shaped by the growing competition and confrontation between the US, China, and Russia. Pakistan will have to manage, balance and protect interests without adversely affecting its relations with any of the major powers.
- Notwithstanding the hurdles and India's efforts to create instability in Afghanistan, Pakistan must continue to make sincere and concerted efforts to bring stability in the country.
- Global policy of appeasement towards India for short-term political and commercial interests may encourage irresponsible and aggressive Indian behaviour and could push the region towards war. Pakistan has to guard against these destabilizing developments, while keeping the possibility of normalization, only if India agrees to revert its inhumane actions against the Kashmiris and agrees to engage in a bilateral dialogue.
- States are working to develop weapons for the future, which include hypersonic weapons, laser guns, electromagnetic guns, cyber weapons, etc. The narrowing of gap between technologically advanced and the less developed countries has increased the risk of wars. To prevent such a possibility, there is a need to reform the UN to make it more powerful and effective, so that it can play the desired role of maintaining global peace.
- We have reached a point where technological developments are almost equalling man's imagination and principles of combat are under stress thus making it imperative to re-write the rules of war. This could be done by preparing 'warrior scholars', who can think differently and also have good understanding of the air power and the principles of war.
- Hybrid strategies have made war more complex by blurring the lines between military and the non-military means. For Pakistan to fight Hybrid War, it must develop political consensus, maintain Credible Minimum Deterrence (CMD) posture, build alliances and make efforts to convert US-China competition into collaboration.
- New methods of training need to be crafted to suit next generation of officers as per their learning abilities, to prepare them for the next generation of aircraft. This may require fundamental rethink in how we train our future air warriors.
- Cyber weapons have become relatively easy to procure and are likely to be used in future wars. Sophisticated versions of cyber weapons, such as the Nitro Zeus is likely to be the weapon of first choice as they could neutralize adversary's critical assets, including the nuclear C2, air defences, communication systems and power grids.
- The objective of the state-sponsored cyber-attacks, which have increased dramatically in the past few years, is very different from private ones that is to disrupt the fabric of the target country. Pakistan must prioritize and indigenize cyber-security and invest in new technologies such as AI, quantum computing, blockchain, robotics, etc. to protect its vital assets.
- The politically desire and technologically possible must not be allowed to trump International Law.

- AI with machine learning can significantly improve the analytics and bring economy of effort to military operations, but these technologies are also vulnerable to cyber-attacks. It is therefore important that the human component remains relevant to keep the war within the ambit of international law and to make the final decision during a combat.
- There are various obstacles to force posturing process; including financial, industrial, and political obstacles. Except for the super powers, other countries like Pakistan have to rely on: building alliances and partnerships, and find efficient capacities and adapting trainings; to raise the operational level of their forces to the highest point.

SUGGESTED POLICY PAPERS

Evolving World Order and Risks of War

The international governance system has proven to be inadequate to deal with the current challenges and prevent mistakes in several parts of the world. Likewise, several leading democracies continue to elect leaders who have proven to be inept. The rise of right wing and nationalist leaders with fascist tendencies is creating unrest in several parts of the world leading to further erosion of rule based system. In addition, the advent of new technologies has made wars more complex blurring the lines between legitimate and illegitimate actions of a state or a non-state actor. These developments have increased the likelihood of future wars and have enhanced their lethality.

Research Questions:

- Is there a way to bring structural reforms at the international level and establish good democratic principles at the state level, to help improve the plight of the global humanity?
- Is there a need to re-write the rules of war and hold states, especially the powerful ones, accountable?

Information and Computer Technology as an Equalizer for Developing States

Since everything these days is driven by computer technology, it needs programs and application developers to make this happen. Knowledge is more important in present day economy than industrial capacity. Acquisition of computer hardware is easier than launching mega industrial projects.

Research Questions:

- Is it easier for developing countries to leapfrog and catch up with the developed world?
- If yes, what should be their prioritization between software development, data fusion and analytics, artificial intelligence, cyber security and robotics?
- Is the developed world willing to enable developing world to catch up with them?
- Can open source knowledge be enough for the developing countries to succeed?

Data Fusion for Security Analysis

Data fusion is the process of assimilating multiple data sources to produce a coherent and accurate picture of a particular incident or phenomenon. Information revolution has opened up numerous sources of information in the contemporary world. While information holds great power, its utility is only possible by consolidating and processing that information in timely manner. Particularly in security domain, availability and access to information is the key for staying ahead of the adversary, e.g. integrating commercial satellite imagery information with social media information.

Research Questions:

- What are the sources and techniques of data fusion?
- What is the significance and utility of data fusion for open source intelligence (OSINT)?
- What are the prospects, risks and issues in using data fusion for security analysis?

Weaponization of Artificial Intelligence

Artificial Intelligence is not entirely a novel technology rather it has been employed since 1940s. However, with the availability of more data and better computer processing speed, there has been towering advancements in the field, and it has emerged as a potent enabler. AI has exhibited its fruit in the commercial sector with blinding results. Hence considering its immense potentials, there has been a race towards employing this dual-use technology in the militaries of the modern world. While developing countries and technology experts have persistently advocated for averting integrating this lethal technology in the defense arenas, the major powers have expressed no appetite for avoiding the trend of modernizing their militaries with AI. Currently, U.S. and China are the front runners in the field of AI and have been involved in new arms race similar to that of U.S. and Soviet Union. The previous arms race was not sustainable due to Soviet's lack of indigenous technological advancements. On the other hand, China has homegrown capabilities which enable it to challenge the hegemony of U.S. in the technological race. Consequently, a number of other states and private companies have also been on their way to employ AI in military applications.

Research Questions:

- a. What are the contemporary military applications of AI in the defense sector?
- b. What are the implications associated with the militarization of AI on global and regional levels?
- c. What steps should be taken by the international community in order to shape norms and laws in order to curtail the impending threat?

Strengthening Force Posturing through Alliances

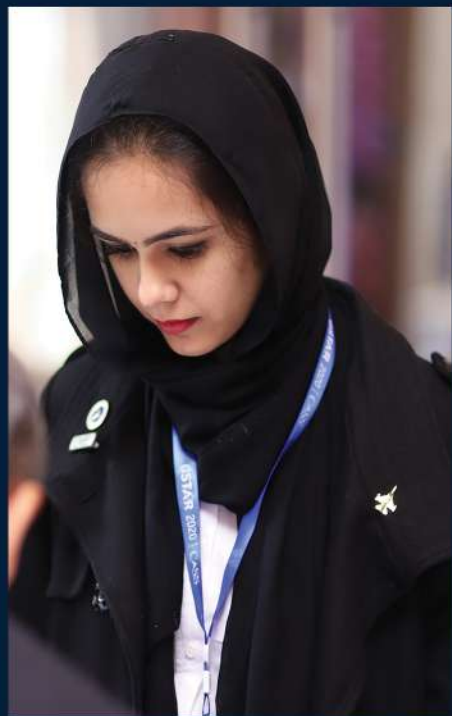
Politically powerful countries, such as the USA, Russia, China, France and Britain can exert strong force posturing. It is evident that independent and strong force posturing is essentially possible for the politically, industrially and militarily powerful countries, who control the military complexes and can exert political pressure. Whereas weaker states are always at the mercy of military giants and their defense supplies. These weaker states often endure supply disruption, sanctions and political oppositions among other hurdles that directly influence and dictate their defense postures. The solution General Steininger proposed is to form 'alliances and partnerships. The question that arises here for the weaker states is what sort of alliances weaker states should form and how these alliances can influence strong force posturing?

Research Questions:

- a. Should weaker states form alliances with other weaker states, given that powerful states will still be able to influence them?
- b. Can an economic alliance between weaker states turn into military alliances/cooperation?
- c. What are the prospects of developing cross-dependence, industrial cooperation or pooling and sharing of resources in South Asia?
- d. What would be the greatest threat to cohesion of the alliance of the weak?



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