Colombo Air Symposium

24-25 October 2019
Eagles’ Lakeside Banquet and Convention Hall
Colombo, Sri Lanka
I consider it a great honour and privilege to extend my earnest congratulations for the Colombo Air Symposium 2019 of the Sri Lanka Air Force that showcases its extensive progression over the years and its momentous service in the defence of our Motherland. Indeed, I am extremely pleased that being an integral element of the security forces of the motherland, the Sri Lanka Air Force, has engaged in accommodating this prominent endeavour for the fifth consecutive year, conceptualizing “A Small Air Force: Way Forward in Achieving Future Vision” as the theme for 2019.

At the moment, eccentric threats have become the foremost concern of nations worldwide. Global terrorism is shifting towards an unconventional conflict, threatening all countries of the world. It is obvious that national and regional security has become the foremost factor nowadays and being the key emphasis of nation’s air power, the Sri Lanka Air Force is playing an active role in supporting national security and regional security requirements in keeping with our national goals.

In the past few decades, there was an era of remorseless terrorism in the country that caused multitudinous harm to the whole socioeconomic structure of the country and the enormous challenge was to end that ruthless terrorism through the Humanitarian Operation. As the State Minister of Defence, who is responsible for peace, defence and security of the country, I must mention that there are many challenges to face as a country and the Air Force has a vital role to play in the future to overcome these challenges.

Considering the theme “A Small Air Force: Way Forward in Achieving Future Vision”, the Sri Lanka Air Force must be ready to meet the challenges of the future and to possess meaningful, credible defence strategies for either unilateral self-defence, or participation in joint and combined operations using Air Power.

Finally, I should be thankful for the Commander of the Air Force for his commitment, substance, vision and effort made in organizing this important event, and I wish him, his subordinates and all participants all the success for their future endeavours. I congratulate all for organizing such a successful symposium. I would like to thank the foreign delegates and their respective governments who are making a wonderful contribution by sharing their knowledge and experiences at this forum.

Hon. Ruwan Wijewardene, MP
The State Minister of Defence
It is with the utmost admiration that I extend my heartfelt felicitation to the Colombo Air Symposium 2019 of the Sri Lanka Air Force. This annual remarkable occasion of the Sri Lanka Air Force symbolizes its state-of-the-art achievements and the dynamic role performed over the past decades in the scenario of air space protection and national security. As the Secretary of Defence I am much pleased that Sri Lanka Air Force has undertaken the mammoth task of hosting this significant forum for the fifth successive time under the theme “A Small Air Force: Way Forward in Achieving Future Vision”.

In the present scenario the operational challenges in the application of airpower have widened and emerging technologies in the domains of unmanned warfare, precision weapons, sensor and information systems have improved. Hence, the advances in air power can be especially important to small Air Forces. Being a small Air Force, we need to be ready to meet the challenges of the future by developing meaningful unilateral self - defence capabilities or participate in joint and combined operations. Similarly, being a small Air Force committed to achieving our vision, we need to provide the most flexible, rapid and lethal response for military contingencies.

Aerospace power is futuristic and increasingly utilitarian. The SLAF has come a long way. It has demonstrated its professionalism and the world has acknowledged it. In this milieu, it is of vital importance that the Sri Lanka Air Force as a small Air Force seeks to deliberate on achieving its future vision by meeting challenges of the future. Aerospace power is inherently supple and its application is not constrained by geographical areas. It can easily be assigned to any task on priority to accomplish the objectives - current or overall. I am confident and hopeful that this Symposium will open up a forum to boost and debate the collaborative endeavors in order to address the common issues at present.

In conclusion, I am extremely happy to extend my appreciation to all the foreign delegates, the research authors and the scholars, who contributed and shared their knowledge and insights. I believe that the intellectual contributions will lead to a fresh debate on policy level changes and enlighten this august forum concerning the strengthening of defence and security of the region. Ultimately, I thank the Commander of the Air Force and the Organizing Committee of the Colombo Air Symposium for striving hard and taking all pains in organizing this enormous and splendid forum.

I also wish all participants continued success in their future undertakings and to make this event a very inspiring session.

General SHS Kottegoda (Rtd)
WWV, RWP, RSP, VSV, USP, ndc
Secretary
Ministry of Defence - Sri Lanka
As the Commander of the Sri Lanka Air Force, it indeed bestows upon me a great pleasure to welcome you to the Colombo Air Symposium 2019, the premier annual international airpower discourse hosted by the Sri Lanka Air Force. This profound forum, which unfolds for the fifth time, would definitely expand the dimensions of airpower further into the new frontiers with the immense scholarly contributions that are undoubtedly brought forward by the national and international level speakers, military leaders, diplomats, think tanks and researchers.

The domain of airpower has dramatically transformed and expanded into multiple territories along with the pragmatic applications coined in seeking solutions to unique and ever dynamic global, regional and national level challenges. The constant and productive dialogue among the learned and the experienced personalities in the field is the mainstay in apprehending a glimpse of the future airpower and propelling the existing machines, mechanisms and the applications towards that future. In addition such knowledge enhancements will inevitable result in formulating and nurturing novel and concepts in airpower.

The Sri Lanka Air Force, being a ‘small Air Force’ in the South Asian region hosts The Colombo Air Symposium 2019 under the theme of “A Small Air Force: Way Forward in Achieving Future Vision” with the intention of initiating the dialogue on placing relatively small Air Forces on the world airpower map, redefining their future visions, roles and their modus operandi in facing the challenges imposed by the dynamic security landscape which requires greater cooperation in joint and combined operational capacity.

Accordingly, the scholarly contributions, which will unfold here, will definitely enrich the audience and the fellow presenters and in the long run, this profound knowledge is expected to be disseminated horizontally and vertically towards different spheres of professionals and the policy makers.

I, most gladly take this opportunity to extend my wholehearted gratitude to all the presenters for their intellectual contributions and to all the delegates for being here to witness this insightful forum. I am sincerely confident that yet again the Colombo Air Symposium will be a stimulating discourse that is the catalyst to explore and understand the distinct hues of airpower in the future of small Air Forces.

Air Marshal Sumangala Dias
RSP and three Bars, VSV, USP, MSc (Def & Strat Stu), ndc, psc
Commander
Sri Lanka Air Force
MESSAGE
FROM THE DIRECTOR TRAINING

It is with the utmost pleasure that I pen these words of felicitation as the Director Training in this significant occasion of the Colombo Air Symposium 2019, the most remarkable international scholarly event of the Sri Lanka Air Force. This momentous annual occasion is a stepping stone to foresee the Air Power strategies of the regional countries and to share the visionary beliefs and ideas of stalwarts in the field of military and defence. Hence, the Sri Lanka Air Force has taken up the herculean task of hosting this significant forum for the fifth consecutive time under the theme “A Small Air Force: Way Forward in Achieving Future Vision”.

As an island nation with a relatively small Air Force, Sri Lanka has to face the challenges of global terrorism, which is constantly drifting from conventional to unconventional warfare, aggravating the situation and forcing countries to think of diverse strategies in order to cope with. On the other hand, even the relatively massive air forces too have found it a challenging task to face the threats coming up from different directions.

Therefore, the Colombo Air Symposium 2019 will pave the way to establish and enrich the national security concerns towards small Air Forces in order to address common issues including drug trafficking, shortcomings in disaster management mechanisms and combined rescue operation strategies.

In conclusion, I would like to take this opportunity to convey my sincere gratitude to the Commander of the Air Force, Air Marshal Sumangala Dias for taking all the measures in organizing this mega event in such a grand manner. At the same time I express my thankfulness to the Chief of Staff and the Air Force Board of Management for their continuous guidance and assistance given. I would also like to acknowledge the Organizing Committee who collectively bore a massive responsibility in bringing this mega event to a successful one. Finally, I wish to thank the research authors who contributed enormously in sharing their gathered experience and expertise knowledge. I earnestly expect that the intellectual discourse of this symposium will undoubtedly achieve the event’s expectations.

Air Vice Marshal MDAP Payoe
RWP, RSP, USP, MSc (NSWS - Pak), ndc (Pak), psc
Director Training
Sri Lanka Air Force
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The Colombo Air Symposium (CAS), the annual international academic forum of the SLAF, disclose for the fifth consecutive time inviting the intellectuals, diplomats, military leaders, policy makers and the technological experts to explore the future of the air power through delving into a specific stream of study. This year’s theme “A Small Air Force: Way Forward in Achieving Future Vision” will explore the future of small air forces in addressing the challenges impending from ever dynamic global realities which require a wider understanding and stronger collaborations. The dialogue will flow along the following session themes.

- Doctrine beyond Dogma
- Conceptual Transition
- Paradigm Shift of Air Power
- Exploring Core Competencies
- Customized Propagation
- Fostering Aerial Diplomacy

Air power, through which the nexus of the man and space warfare is shaped, is the most challenging force being utilized over a few centuries. The impact of the airpower has been elementary in changing lives of millions of humans. Since the WWII, the air power’s domination over the ground and marine power is unprecedented and presently it seems to be evolving into multiple directions other than the military purposes. The air power is a highly effective, efficient and a dynamic force which possess the quick accessibility in a crisis situation but at the same time it is extremely costly and associated with high risk on the men and the machines involved. While the larger air forces are expanding vertically and horizontally, there are unavoidable encounters of limitations emerged from multiple directions including budgetary and technological restraints. The comparatively smaller air forces too are, bound to come across with critical concerns unique to them by nature and also with issues common to all the air forces alike.

The capability gap is one of the biggest challenges faced by a small air force. Dwindling economies force the budgetary cut downs and downsizing the forces especially; during a post conflict era in which the nation building and rehabilitation precede the enhancement of the military. Also the extremely high costs of acquiring and maintaining aircraft and other essential equipment seriously restricts the size, capability and the scope of a smaller air force. However, the role of small air forces in the global context is yet to be defined with a multidimensional approach. It is obvious that the individual attempts to address a mass scale issue is challenging for any institution of air power, regardless of its size or the capability. Unless these individual capabilities are combined through integrating novel procedural approaches backed by the national and international policy, the wide objectives of a collective global air power would not be achieved. Although the concerns for the national security, the dynamic political developments, staggering economic issues, scarcity of training capabilities, smart weaponry, cyber threats and the ever growing asymmetry in the future warfare impose insurmountable barriers for a small air force: being a unique player in an international air power collaboration, joint air operations become a prime condition.
for the existence of small air powers in the future. Especially, in dealing with the global issues that surpass the national boundaries, the ability to accommodate a swift transformation and connecting to an extended air power network is the biggest challenge the world faces today. Exploring all possibilities of collaboration and cooperation is an essential condition to evolve the air power into the next phase of a global air power which is capable of large-scale operations and to provide wider air coverage to all regions in collaborative operations including HADR missions.

Although the idea is highly affirming and appealing, building up a global air power is still a conceptual child which requires constant development and priming through authentic dedication and internalizing the experiences of each player in the field of air power. Bringing the novel concepts of collaboration into the doctrinal level is the definite challenge we face today and it would undoubtedly decide the future of the world air power. Every year the CAS provides the international scholarly community an avenue to delve further into the findings and experiences of each other and to generate new knowledge which leads to a greater air power capability required by the future. Today, the Colombo Air Symposium unveils for the fifth consecutive time under the theme of “A Small Air Force: Way Forward in Achieving Future Vision”, opening the doors for the foreign and local military leaders, diplomats, intellectuals and air power experts to share the knowledge and experiences in coining a futuristic vision of a combined airpower which utilizes the strength small air forces.

The two-day long presentation sessions are held in the picturesque venue, the Eagles’ Lake Side Banquet and Convention Hall. CAS 2019 hosts a wider international participation of 25 countries this time and presents twelve research papers comprising of six international representations from Australia, Bangladesh, India, Japan, USA, five local researches including four representations from the tri-forces of Sri Lanka along with two research papers from local think tanks, affirming our greater objectives in the time to come.
Objectives

The ‘Air Symposium 2019’ is themed as “A Small Air Force: Way Forward in Achieving Future Vision”, and the discourse will lead towards the following main objectives.

1. To enhance the knowledge transferring and understanding the capabilities, the strategic prominence and the possible air power combinations of small air forces.

2. To encourage the inclusion of small air forces in coining air power solutions for regional and global level issues.

3. To explore the future avenues of deploying the collaborative air power in encountering the security, economic and natural issues.

4. To provide a platform to absorb the experiences of deriving positive outcomes in a strategically challenging geo-political condition.

5. To establish a dialogue on possibilities of multilateral air-strategic relationships which would be required by the dynamic geo-political developments in the world.
History of the Colombo Air Symposium

Colombo Air Symposium 2015

The SLAF hosted the inaugural Air Symposium on 30th November 2015 under the theme of “Nation Building through Maritime Air Security” moving parallel to the steps of the country’s nation building approach in a post conflict era. During the session eight research papers were presented and laid the foundation for a wider dialogue on the maritime air security in the Sri Lankan and the South Asian contexts.

The contemporaneous experiences of a three decade long armed conflict which confronted a terrorism that was acquiring the seedlings of marine and air power has increased the Sri Lanka’s concern over the maritime air operations. The constant occurrences of maritime security breaches including the piracy made the theme to light the interest among the military leaders and many others who were engaged to the fields of defence and security. Throughout the discourse the specific maritime air applications related to Sri Lanka and the region were widely discussed and paved the way to blueprint the future maritime airpower developments of the country.

The Egales’ Lake Side Banquet and Convention Hall was selected as the venue for the event and Air Marshal Gagan Bulathsinhala fostered the symposium as the Commander of the Sri Lanka Air Force. The former Secretary to the Ministry of Defence Eng. Karunasena Hettiarachchi graced the occasion as the chief guest.
Colombo Air Symposium 2016

The Colombo Air Symposium was held on the 1st and 2nd December 2016 exploring the theme of "Air Power in the Context of Regional Defence and Security". Twelve research papers were presented during the two days and the CAS 2016 was significant due to the research contributions from eminent international military experts representing Australia, India, Pakistan and Bangladesh. The discussion of the delegates and the researchers directed towards the collaborative efforts of air power in meeting the security challenges emerging in the region.

The SLAF hosted the event under the guidance of Air Marshal Kapila Jayampathy the Commander (then) of the Sri Lanka Air Force and the Secretary to the Ministry of Defence (then) Eng. Karunasena Hettiarachchi graced the event as the chief guest.
Colombo Air Symposium 2017

The Colombo Air Symposium has evolved into an annual international forum exclusively dedicated for the airpower related discourse and in the year 2017 the symposium accommodated twelve research papers under the theme of “Air Power in Addressing Asymmetric Threats”. The timely theme kindled the intellectual interests of many a researchers from the national and international backgrounds related to the fields of defence and security. The international contribution consisted of five research papers from Bangladesh, India, Pakistan and USA and seven papers from Sri Lanka. Diplomats and representatives from 17 foreign countries participated in the event.

Air Marshal Kapila Jayampathy, then Commander of the Sri Lanka Air Force patronized the event for the second time and Hon. State Minister of Defence Mr. Ruwan Wijewardhane participated in the event as the chief guest.
Colombo Air Symposium 2018

The Colombo Air Symposium unveiled for the fourth consecutive time on the 18th and 19th October 2018 and significantly the Colombo Air Symposium 2018 had a widest international participation of 25 countries. Six international representations from Australia, Bangladesh, India, Japan, Nepal, USA, five local researches including four representations from the tri-forces of Sri Lanka and two research papers from local think tanks enriched the forum and delved deep into the “Air Strategy in Substantiating the Geo-strategic Importance of Sri Lanka.”

Air Marshal Kapila Jayampathy, the previous Commander of the Sri Lanka Air Force patronized the event for the third consecutive time and His Excellency the President of Democratic Socialist Republic of Sri Lanka Hon. Maithreepala Sirisena graced the event as the chief guest.
The Egales’ Lake Side Banquet and Convention Hall, the famous venue of the Colombo Air Symposium is located in a picturesque watery haven amidst the suburbs of Colombo city, the commercial hub of Sri Lanka. Colombo, the prominent port city claims a history that extends beyond 500 years now. The ancient Colombo Harbour had been the portal of trade with the outside world. Today, the Colombo city has outgrown the port as well the fort boundaries for miles away and new landmarks have emerged over the old, defining new borders for the city which portrays the future of this island nation.
Chief Guest’s Profile
Hon. Dinendra Ruwan Wijewardene was sworn in as the State Minister of Defence of the Democratic Socialist Republic of Sri Lanka on 12th January 2015 and is one of the youngest politicians to hold this important portfolio in the modern history of our country.

Mr. Ruwan Wijewardene was born on 04th of August, 1975 as the youngest child to Mr. Ranjith Wijewardene and Mrs. Ranjani Neela Senanayake Wijewardene.

Mr. Wijewardene began his school life in 1981 when he was enrolled into one of the best private schools in the country, St. Thomas’ Preparatory School in Colombo. As a brilliant student, he not only exhibited excellence in studies but was also an avid sportsman. He began to reflect inborn leadership qualities as early as his school days both in the playing field and in the school. In 1991, the school management bestowed him with the responsibility of the Head Prefect. After completing primary and secondary education at St. Thomas’ he later joined Stafford International School in 1992 and completed the London A/L s.

In 1995, Mr. Wijewardene left the country to the United Kingdom to continue his higher studies. He entered the Sussex University, a prestigious seat of learning in the UK. He returned to his motherland where his destiny to greatness awaited with a BA in Politics (Specializing in Third World Politics).

Due to his visionary desire to assiduously serve his people and the nation, he continues to seek ways and means to enhance his knowledge, experience and exposure both within and outside the country. He as recently as in 2013 completed a leadership course at the East West Center in Hawaii, which was designed for young elected Representatives of Asia and the Pacific.

Hon. Ruwan Wijewardene hails from an eminent political dynasty that had produced many freedom fighters and national leaders who had led the country since its independence.

In 2009 on contesting the Provincial Council Elections, he was elected to office as a Member of the Western Provincial Council. He gained national prominence when he entered to the Parliament after successfully contesting the Parliamentary Elections in 2010.

For Hon. Ruwan Wijewardene to be offered an important portfolio as The State Minister of Defence is testimony to his personal ideals of politics. His appointment as State Minister of Defence by His Excellency the President Maithripala Sirisena subsequent to the Presidential polls in January 2015 reaffirms the qualities that were identified in him by his political mentors.
Speakers’ Profiles
General Shantha Kottegoda (Rtd), WWV RWP RSP VSV USP ndc holds a distinguished military career spanning over 36 years during which many key appointments were held in all areas of defence, intelligence, peace keeping & conflict resolution, with the ultimate appointment as the seventeenth Commander of the Sri Lanka Army in 2004. During this period he received special training on intelligence & protective security by the MI5 British Security Service and many other military institutions in USA & India. He is a prestigious alumni of the National Defence College and a proud product of St. Thomas’ College, Mt Lavinia. Gen Kottegoda was a keen sportsman and was awarded with college colours for representing the 1st XI cricket team in 1968 & 69, as well as for athletics.

During his military career he has held many command positions including the Commander of Security Forces, Divisions and Brigades. He has also functioned as the Chief of Staff, Deputy Chief of Staff, Commandant of the Volunteer Force, Director Military Intelligence, Director General Training and Director General - General Staff. He was seconded to the National Intelligence Bureau (NIB) where he served as Director in charge of counter terrorist division.

From September 2002 till March 2003 Gen Kottegoda acted as a member of the delegation nominated by the government of Sri Lanka at the peace discussions facilitated by the Royal Norwegian government in order to bring about peace treaty between the Liberation Tigers of Tamil Eelam and the government of Sri Lanka.

His dedication and bravery in the battle against terrorism were awarded with Weera Wickrama Vibhushana (WWV), Rana Wickrama Padakkama (RWP), Rana Sura Padakkama (RSP), Utthama Seva Padakkama (USP), Vishista Seva Vibushanaya (VSV) for unblemished, exceptional and exemplary conduct.

His military career was followed by diplomatic missions representing Sri Lanka as the Ambassador of Sri Lanka to Brazil and then to Thailand and accredited to Laos & Cambodia, during the time he was also a permanent representative of UN ESCAP in Bangkok, Thailand. Gen Kottegoda received one of the highest honours for his efforts to improve and strengthen the relationship between Brazil and Sri Lanka during his Ambassadorship in Brazil, the Presidents Medal in Brazil, for the distinguished contribution & services made by a foreigner for the uplifting of friendly relations between the two countries.

Gen Kottegoda assumed duties as the Secretary to the Ministry of Defence on 29th April 2019. He is married to Mrs Sonia Kottegoda and blessed with a son and a daughter.
Dr David Brewster is a Senior Research Fellow of the National Security College, Australian National University, where he works on Indian Ocean security and Indo Pacific issues.

He is one of the foremost experts on Indian Ocean security and consults with government agencies in Australia and throughout the region.

Dr Brewster’s current work includes:

- Australia’s future strategy in the Indian Ocean.
- Environmental security threats in the Indian Ocean.
- Analysis of the development of China’s future military presence in the Indian Ocean.

Dr Brewster’s books include India as an Asia Pacific power, about India’s strategic role in the Asia Pacific and India’s Ocean: the story of India’s bid for regional leadership which examines India’s strategic ambitions in the Indian Ocean. His latest edited volume is India and China at Sea: Competition for Naval Dominance in the Indian Ocean.

Dr Brewster’s recent reports include Australia’s Second Sea: Facing our Multipolar Future in the Indian Ocean.

He is also part of a major Australia-France project to review environmental security issues in the Indian Ocean. The project’s first report, Environmental security in the eastern Indian Ocean, Antarctica and the Southern Ocean: A risk mapping approach, was published in May 2019.

Dr Brewster’s latest report is Ocean horizons: Strengthening maritime security in Indo-Pacific island states. This will examine the maritime security needs of island states in the Indian and Pacific Oceans and what Australia and other countries can do to assist the island states. This will be released in December 2019.
Air Marshal Dambure Liyanage Sumangala Dias joined the Sri Lanka Air Force on 13th December 1984 as an Officer Cadet in the General Duties Pilot Branch in the 13th Officer Cadet intake. On completion of the Basic and Advanced phases of flying training, he was commissioned as a Pilot Officer in the GDP branch on 15th August 1986.

Air Marshal Dias completed his Staff Course at the Defence Services Staff College in Wellington, India in 2001 and completed National Defence Course in Mirpur, Bangladesh. He has also completed Junior Command and Staff Course in India, Joint Air Warfare Course at IAF, India and Aircraft Accident Investigation Course in Pakistan.

On 21st October 1996 he was appointed as the Commanding Officer of No 02 Heavy Transport Squadron at Sri Lanka Air Force Base Ratmalana and subsequently as the Commanding Officer of No 08 Light Transport Squadron at Sri Lanka Air Force Base Ratmalana. On successful completion of Staff College, he returned to flying duties and took over as the Commanding Officer of No 06 Helicopter Squadron at Sri Lanka Air Force Base Vavuniya on 26th June 2002. On 01st June 2005 he was appointed as the Base Commander Sri Lanka Air Force Base Hingurakgoda which consists of three lodger formations including two helicopter squadrons. He was also appointed as the Senior Air Coordinator for the Humanitarian Operations and actively performed duties with the ground commanders located in North and East theaters (57, 58 and 59 Divisions) until the completion of the Humanitarian Operations in year 2009. On 05th December 2009 he was appointed as the Base Commander Sri Lanka Air Force Base Ratmalana which consists of six lodger formations including two flying squadrons, where he completed number of development projects including an international standard rugby ground.

He was appointed as the Base Commander Sri Lanka Air Force Base Katunayake which consists of twenty five lodger formations including three flying squadrons for the period from 30th April 2012 to 10th June 2013. He was appointed as the Command Flight Safety Officer and subsequently as the Deputy Director Air Operations in the year 2013. He was appointed as the Deputy Director Logistics on 28th February 2014 and became the Director Logistics on 01st July 2014. On 15th June 2016 Air Marshal Dias was appointed as the Acting Director Operations of the Sri Lanka Air Force. Air Marshal DLS Dias was appointed as the Chief of Staff of the Air Force w.e.f 01st October 2016 until he was appointed as the 17th Commander of the Sri Lanka Air Force.

Air Marshal Dias has been awarded the Vadamarachchi Operation Medal, Purna Bhumi Service Medal, Desha Putra Sammanaya, Rana Sura Padakkama four times with Three Bars, North & East Operations Medal, Riviresa Campaign Service Medal, 50th Independence Anniversary Commemoration Medal, Sri Lanka Air Force 50th Anniversary Medal, North Humanitarian Operational Medal, East Humanitarian Operational Medal, Uththama Seva Padakkama and the Vishishta Seva Vibushanaya.

Air Marshal Dias has been a proud recipient of the Desha Puthra Sammanaya, as a result of injuries he sustained due to enemy fire over Silawathuriai during a casualty evacuation mission, which was carried out under heavy enemy resistance in Eelam War II. In 2008, as the Senior Air Coordinator for the final stages of Eelam War IV, he was instrumental in synchronizing air operations with the ground operations of the 57, 58 and 59 divisions of the Sri Lanka Army, contributing decisively to the successful and speedy culmination of the humanitarian operation and the conflict that had plagued Sri Lanka for thirty years.

He served as the first Chairman of SLAF Tug of War in 2011. He was the Chairman SLAF Athletic in 2012 and the Chairman SLAF Cycling in 2014. He also served as the Chairman Rugby Advisory Committee.

Air Marshal DLS Dias is married to Mayuri and blessed with two children, Bimsara and Visaka.
Air Vice Marshal MDAP Payoe
RWP, RSP, USP, MSc INSWS - Pak, ndc (Pak), psc
Director Training
Sri Lanka Air Force

Born in Bandarawela in the Uva Province in 1967, Air Vice Marshal MDAP Payoe had his education from the St. Thomas College, Bandarawela. He joined the Sri Lanka Air Force as an Officer Cadet in the General Duties Pilot Branch in 1985. Having undergone his Basic Combat Training at SLAF Diyatalawa and Basic Flying Training at Air Force Academy China Bay, he proceeded to Pakistan for further flying training based on his meritorious achievements. Having graduated as a military flyer in Pakistan in 1988 he was commissioned in the rank of Pilot Officer and was initially posted to No. 4 Helicopter Squadron. Since then, in the capacity of an operational helicopter pilot, he took part in almost every major operation conducted during the terrorist conflict in the Island. Air Vice Marshal Payoe, at the same time steadily achieved the professional milestones in his career and went on to captain a few type of rotor wing aircraft.

He was trained on Cessna 150 and Chipmunk in Sri Lanka and Mushak MFI 17 and T 37 aircraft in Pakistan. After returning to Sri Lanka he became qualified on BELL 206, BELL 212, BELL 412 and MI 24 helicopters. Thus far, he has logged 7200 flying hours to his credit after having engaged in VIP, VVIP, combat and search & rescue missions. He commanded No. 07 Squadron and No. 09 Attack Helicopter Squadron at SLAF Base Hingurakgoda before being appointed as the Commanding Officer SLAF Katukurunda in 2004. From end of 2005 to 2008 he commanded No 04 VVIP squadron at SLAF Base Katunayake. After completion of the staff course he was appointed to the office of Base Commander SLAF Base Vavuniya followed by that of the Chief Instructor Air Wing DSCSC Sapugaskanda. Air Vice Marshal Payoe attained a notable feat in his career when he was entrusted with the prestigious appointment of the Sri Lankan Defence Attaché to the Russia Federation in 2010. Having served a successful stint in Moscow Russia, he was again assigned to the DSCSC as the Chief Instructor of the Air Wing from 01 August 2012 followed by that of Base Commander Sri Lanka Air Force Base Vavuniya for the second time. Air Vice Marshal Payoe also commanded SLAF Station Colombo as the Commanding Officer and SLAF Base Katunayake as the Base Commander before being appointed as the Director Training.

He has followed a number of overseas training courses and a few among many are; Junior Command and Staff Course in India, Flight Safety Course in Pakistan, Higher Defence Orientation Course in India, Aircraft Accident & Investigation Course in Pakistan and Search & Rescue Administration Course in Singapore. He has attended a number of conferences and combined exercises in Japan, Thailand, Russia, Alaska and Guam representing the SLAF. He is a proud product of Defence Services Command & Staff College Sapugaskanda, Sri Lanka and graduate of the National Defence University, Islamabad, Pakistan in National Security and War Seminar. For his bravery he has been awarded with the Rana Wickrama Padakkama and Rana Sura Paddakkama.

Presently he serves in the capacity of Director Training of the Sri Lanka Air Force. In addition to that he is holding the appointment as the Chairman of Sri Lanka Air Force Cycling. He is married and blessed with 02 daughters.
Born in 1967, Air Vice Marshal Abdul Moeed Khan joined Pakistan Air Force in October, 1984 and received his initial training and intermediate education at PAF College, Sargodha. After completion of his academic and flying training, he way graduated from Pakistan Air Force Academy in December, 1989. Having qualified fighter and operational conversion courses, he flew various types of fighter aircraft on PAF inventory. He has vast experience of fighter and instructional flying and has over 3300 flying hours to his credit.

Air Vice Marshal Abdul Moeed Khan has a rich command and staff experience. He has the distinctive honour to command an elite fighter Squadron at Combat Commanders’ School and subsequently Combat Commanders’ School itself. He has also commanded Military Training Wing at PAF Academy Asghar Khan and has served as Senior Staff Officer at an important operational base. At PAF Academy Asghar Khan he served as Commandant, College of Flying Training. At Air Headquarter, he has served as Director Plans and Assistant Chief of the Air Staff (Plans).

Air Vice Marshal Abdul Moeed Khan holds BSc Honors degree in War Studies and Masters Degree in Strategic Studies. He is a graduate of Air War College, National Defence University and Air War College Alabama, USA.

Air Vice Marshal Abdul Moeed Khan assumed command as Air Officer Commanding at Headquarters Northern Air Command, PAF on 11 July, 2019. In recognition of his meritorious and exceptionally dedicated services, he has been decorated with Tamgha-i-Imtiaz (Military) and Sitara-i-Imtiaz (Military). He is married and blessed with four children.
Air Commodore Udeni Priyadarshana Rajapaksa was born on 29 January 1969. He joined the Sri Lanka Air Force as an Officer Cadet on 06 October 1988 and was commissioned as a Pilot Officer in the General Duties Pilots Branch on 05 October 1990. He is qualified in flying 10 aircraft types and has accumulated over 7000 flying hours to his credit in combat and transport flying. He was promoted to the present rank on 03 November 2016.

The Officer has attended different professional courses including MSc (Mil Op Art) in Air University, Alabama USA, BSc (Def Studies) and MSc (Def. Studies) in Mgt in Kothelawala Defence University, Colombo Sri Lanka and he has done psc at Air Command and Staff College in the Air University, USA. The Officer has also followed the International Security and Strategic Leadership Studies at Royal College of Defence Studies (rcds) in UK, and MA (International Security and Strategy), King’s College, London, UK.

He has served in various appointments including the Commanding Officer No 02 Heavy Transport Squadron, Base Commander SLAF Base Hingurakgoda, Defence Attaché to the Sri Lankan Embassy in the Russian Federation, Senior Air Staff Officer (SASO), Base Commander Sri Lanka Air Force Base Vavuniya and Air Secretary at the Air Force Headquarters Colombo. He is presently holding appointment as the Commandant of the Sri Lanka Air Force Academy, China Bay.

Air Commodore Udeni Rajapaksa has been decorated with Videsha Seva Padakkama, Purna Bhumi Padakkama, North & East Operations Medal, East Humanitarian Operational Medal and North Humanitarian Operational Medal. Further, for his distinguished and exemplary service, he has been awarded Sri Lanka Armed Services Long Service Medal and honoured with the gallantry medal Rana Soora Padakkama three times.

He is married to Mrs Enoka Kamani Rajapaksa and blessed with a daughter, Miyuni and a son Inura.
Moderators’ Profiles
Emeritus Professor of International Relations, University of Colombo, presently he serves as Senior Professor at the Faculty of Defence and Strategic Studies, Sir John Kotelawala Defence University. Previously he served as the Dean of the Faculty of Arts and the Head of the Department of International Relations, University of Colombo. He was appointed the Executive Director (2008-2011) of the Regional Centre for Strategic Studies (RCSS) which is a Regional Think-Tank in South Asia. Since 2013 he has been serving as Sri Lanka Government’s Representative to the ASEAN Regional Forum Experts and Imminent Persons (ARF-EEP) Group. He is a Member of the Boards of Management of the Bandaranaike Centre for International Studies (BCIS) and the Regional Centre for Strategic studies (RCSS). He has also served as a Visiting Professor at the School of International Service, the American University, Washington D.C., and Research Scholar at the Department of International Relations, London School of Economics and Political Science. He has obtained his B.A. from University of Ceylon and M.A., Ph.D. from the University of Washington.

He has also functioned as a Consultant to the National Integration Programme Unit of the Ministry of Ethnic Affairs and National Integration; Member of the Coordinating Committee, Centre for the Study of Human Rights, University of Colombo; Co-Director, Centre for Policy Studies and Research, University of Colombo; Founding Director of the Institute of International Studies (IIS), Kandy; Member of the Boards of Management of the Lakshman Kadirgamar Institute for International Relations and Strategic Studies (LKIIRSS) and the International Centre for Ethnic Studies (ICES). During the period 1994-1997, he was served as a Member of the Presidential Commission of Inquiry in respect of Involuntary Removal and Disappearances of Persons.
Maj. Gen. John B. Williams is the Mobilization Assistant to the Commander, U.S. Air Forces in Europe; Commander, U.S. Air Forces Africa; Commander, Allied Air Command, headquartered at Ramstein Air Base, Germany; and Director, Joint Air Power Competence Centre, Kalkar, Germany. General Williams was commissioned from the U.S. Air Force Academy in 1985.

Few of his academic qualifications are: Bachelor of Science degree from U.S. Air Force Academy, Colorado Springs, Squadron Officers School Course from Maxwell AFB, Strategic Air Command Advanced Instrument Flight Course from Castle AFB, Master of Business Administration from Rensselaer Polytechnic Institute, Troy, Air Command and Staff College course and Air War College course.

His awards and decorations are: Legion of Merit, Defense Meritorious Service Medal with oak leaf cluster, Meritorious Service Medal with three oak leaf clusters, Air Medal with oak leaf cluster, Aerial Achievement Medal with oak leaf cluster, Air Force Commendation Medal with oak leaf cluster, Joint Meritorious Unit Award, Air Force Outstanding Unit Award with Valor Device and two silver and two bronze oak leaf clusters, Combat Readiness Medal with two silver oak leaf clusters, National Defense Service Medal with campaign star, Armed Forces Expeditionary Medal with two campaign stars, Southwest Asia Service Medal with three campaign stars, Afghanistan Campaign Medal with campaign star, Global War on Terrorism Expeditionary Medal, Global War on Terrorism Service Medal, Humanitarian Service Medal, Air Force Expeditionary Service Ribbon with oak leaf cluster, Armed Forces Reserve Medal with M device, NATO Medal, Kuwait Liberation Medal, Kingdom of Saudi Arabia and Kuwait Liberation Medal, government of Kuwait.
Prof. Rohan Munasinghe is attached to the Department of Electronic and Telecommunication Engineering of the University of Moratuwa. He earned the MEng Degree in 1999 and the PhD Degree in 2003 both in Advanced Systems Control Engineering from Saga National University, Japan. After his PhD, he joined Korea Advanced Institute of Science and Technology (KAIST) as a Post-doctoral Research Fellow of KAIST-Stanford University joint research program on advance robotics. He has won research grants from National Science Foundation, Department of Wildlife Conservation, National Research Council, United Nations Development Program (UNDP) and the World Bank to produce many refereed publications and high-tech products. He has won the outstanding researcher award of the University of Moratuwa for many years. He has published one textbook titled “Classical Control Systems: Design and Implementation”, and three book chapters. His main areas of teaching and research are Robotics, Control Systems, Unmanned Aerial Vehicles, Underwater Robotics, Autonomous Intelligent Systems, Artificial Intelligence, and System Optimization. Professor Munasinghe has delivered keynote speeches at annual conferences of SLIIT, IESL, IET, Sri Lanka Institute of Artificial Intelligence, and ToCH institute in India.

He is the Director of the University-Business Linkage Center, also serving in the Senate Research Committee and the Intellectual Property Advisory Committee of the University of Moratuwa. He has served in the Board of Studies, and the Faculty Academic Committee. He pioneered the establishment of the “Vibhava” Product Accelerator of the Department of Electronic and Telecommunication Engineering and established the first staff startup company of the University of Moratuwa in the field of drones. He directed the Engineering Research Unit (ERU) of the University of Moratuwa in 2014 and initiated the “Moratuwa Engineering Research Conference (MERCon)” with International recognition. Prof. Munasinghe has introduced three laboratories and four subject modules in the fields of robotics and controls to the undergraduate and Postgraduate degree programs. He has also contributed to the establishment of the Centre for Advanced Robotics (CAR), and the Centre of Intelligent Transportation Systems.

Prof. Munasinghe is the Chair of the NSF National Committee on Engineering, IT and Architecture, and also serves in the Steering Committee of the Center for Research and Development - Ministry of Defense, Board of Governors - Arthur C Clarke Centre for Modern Technologies, Advisory board - Sri Lanka Planetarium. He has served the Board of Directors of the National Engineering Research and Development Center, and NSF committees on Technology, Science Popularization, and Nanotechnology. He has been the Chairman of IEEE Sri Lanka Section in 2010, and he is the founder chair of IEEE Robotics and Automation Society Chapter in Sri Lanka. He is one of the pioneers of the International Conference on Information and Automation for Sustainability (ICIAfS) and chaired the same conference in 2006.

Prof. Munasinghe is a Charted Engineer, Senior Member of IEEE, member of Robotics and Automation Society of IEEE, and a member of IESL. He is an amateur astronomer, a wildlife enthusiast, and a nature-photographer.
Air Vice Marshal Andrew Wayne Ediriweera Wijesuriya
USP, MSc (MOA) USA, Msc (Def Stu) in Mgt, MSc (NSWS-Pak), MDS, ndc (Pak), psc
Director General Engineering
Sri Lanka Air Force

Air Vice Marshal Andrew Wijesuriya was born on 24th November 1966. He received his primary and secondary education at St Peter’s College, Colombo and the Colombo International School with a very short stint at St Paul’s school Darjeeling, India in-between.

He joined the Sri Lanka Air Force as an Officer Cadet of the 16th Intake of Officer Cadets on 5th May 1986 and was commissioned in the rank of Pilot Officer on 27th December 1987 in the Technical Engineering Branch. He holds a Diploma in Quality Management from the Sri Lanka Standards Institute, a Master’s degree (Defence Studies) in Management from the Kotelawala Defence Academy, Sri Lanka, a Master’s degree in Defence Studies from the University of Kelaniya, Sri Lanka having completed Staff College with the No 1 Defence Services Command and Staff Course at Sapugaskanda, Sri Lanka. He also hold a Master’s degree in Military Operational Art and Science from the Air University, Alabama, USA and a Master’s degree in National Security and War Studies from the National Defence University, Islamabad Pakistan.

During his career of 31 years, he has held a number of Command and Technical Administrative appointments. Some of the significant appointments held are: Officer Commanding Maintenance of the No 5 Jet (F7) Squadron and subsequently of the No 10 Fighter (Kfir) Squadron, Command Armament Officer (Aircraft and Ground Munitions) at the Directorate of General Engineering, Air Force Spokesman and Staff Officer to the Commander, the Head of Training Team of the Air Wing of the Defence Services Command and Staff College Sapugaskanda, Command Media Officer and Staff Officer to the Commander, Command Quality Assurance Officer, Deputy Director Aeronautical Engineering and the present position of Director General Engineering.

Air Vice Marshal Andrew Wijesuriya is Chairman of SLAF Motor Sports and is recipient of the Uttama Seva Padakkama for unblemished conduct. He is married to Sharmila and they have four children.
Dr. Harinda Vidanage is Executive Director, Bandaranaike Centre for International Studies (BCIS), prior to his assignment at the BCIS he was Assistant Professor of International Relations, St. Lawrence University, New York from 2012 – 2016. He has taught courses on International Relations, Global Governance, International Security, Technology & Warfare and global implications of Cyber Politics. He specializes in the area of Cyber Politics, International Security and Geo Politics.

His professional experiences include appointments as Adviser, International Affairs to the Sri Lankan President 2006 - 2010 and the role of Consultant to the Sri Lanka Prime Minister during 2004-2005 on International Affairs. Since 2017 Dr. Vidanage functions as a lead consultant to the SL Army Defense Seminar and Directorate of Training.

Dr. Vidanage is political scientist by training and gained his doctorate from the University of Edinburgh, United Kingdom. Among his scholarly and academic achievements are the Senior Fulbright Award of Scholar in Residence 2011. The Prestigious Overseas Research Scholarship (ORS) awarded by the British Government 2005. The Principals Scholarship awarded by University of Edinburgh 2005.

Dr. Vidanage serves as visiting lecturer, MPhil/PhD Program Faculty of Graduate Studies (FGS) University of Colombo, MA International Relations Program at University of Colombo, Msc in Security & Strategic Studies Kotelawala Defence University (KDU). Dr. Vidanage contributes regularly to electronic and print media analyzing current global political developments. He is the author of the biweekly international affairs column ‘Stratsight’ on the Sri Lankan daily newspaper, the Daily Mirror.
Sanu Kainikara is the RAAF’s Air Power Strategist at the Air Power Development Centre, Canberra. He is a former fighter pilot of the Indian Air Force (IAF) who retired voluntarily as a Wing Commander after 21 years of commissioned service. He is operational on the MiG-21,-23, and -25, has also flown the Hunter and Vampire fighters, and has flown over 4,000 hours on fighters. Dr Kainikara was the commanding officer of an operational fighter squadron and is a Qualified Flying Instructor (A2), as well as a graduate and Directing Staff of the IAF’s Fighter Weapons School (TACDE).

During active service, Sanu was awarded the Air Force Cross and Commendations from C-in-C EAC, and the IAF Chief of Air Staff. He is also a recipient of the RAAF Chief of Air Force’s Commendation.

Dr Kainikara is the author of 22 books (list attached) and has also written four of the five Chief of Air Force Occasional Papers so far published. He has also published a large number of peer-reviewed ‘Working Papers’ and independent chapters in a number of compilations. He has presented papers at a large number of international conferences and published papers on national security, strategy and air power in various international professional journals. He is also a regular contributor to three internationally recognised political journals.

Sanu is currently an Adjunct Professor in the School of Humanities and Social Sciences at the University of New South Wales. He is the inaugural Distinguished Fellow at the Institute for Regional Security (IFRS) based in Canberra and is also a Distinguished Fellow at the Centre for Air Power Studies (CAPS) in New Delhi.

He is a regular Guest Lecturer at the Military Colleges of USA, Canada, UK, Finland, Turkey, Saudi Arabia, Malaysia, Indonesia, Philippines and New Zealand. He has also lectured at the PLAAF Senior Staff Course in Beijing. Dr Kainikara has been placed on a list of 100 Icons of the Indian Air Force in a recently published book 100 Iconic Air Warriors of India.

Dr Kainikara is a graduate of the Indian National Defence Academy, Defence Services Staff College and the College of Air Warfare. He holds an undergraduate honours degree in Economics and Human Resources and a Master of Science in Defence and Strategic Studies from the University of Madras. His PhD in International Politics was awarded by the University of Adelaide.
The Colombo Air Symposium calls military researchers all around the world to produce their scholarly efforts stemming from military expertise, academic excellence, diplomatic experiences and the technical mastery in the fields of defence and security especially with related to the airpower. This year’s theme “A Small Air Force; Way Forward in Achieving Future Vision” invites the scholarly minds in the military to focus on the role of comparatively small air forces in order to keep their mark in the global map of airpower whilst bringing about pragmatic solutions for a highly challenging future.

The preliminary evaluations have short listed 23 outstanding research papers contributed by the authors that represent different facets of academia, military and the diplomatic circles. The final round of evaluations has selected the 12 papers which will be presented at the Colombo Air Symposium 2019 and the following were among the short listed researches.

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Research Abstracts & Authors
Abstract

A Small Air Force is seen as an Air Force that whilst holding the ability to apply itself across the spectrum of air power, is limited in its ability to conduct prolonged operations as well as to the desired extent. Thus, in times where a country is transiting from war to peace such a force takes a heavy toll in terms of organizational sustenance and growth which further affects its outcome. Undeterred it must be in the best interests of the nation as well as the Air Force to forge through whatever the conditions imposed to meet the security challenges that the nation may face and warrants a response through the third dimension. The appreciation of the threats in face, the identification of the action needed and best course of action forward would be the resultant of a carefully thought out strategy which involves technology, synergy and innovation which helps to mitigate the limiting factors of a small Air Force.
Air Vice Marshal PDKT Jayasinghe was born on 09th March 1966 in Sri Lanka. He joined SLAF on 02 July 1985 and was commissioned in the General Duties Pilot Branch on 1st January 1987. He is a VVIP rated pilot with over 6500 flying hours both from Fixed Wing & Rotor Wing aircraft to his credit. For his operational service he has been decorated with Rana Wickrama Padakkama (RWP), and Rana Sura Padakkama (RSP) in three times. Further he was awarded the Vishishta Seva Vibhusanaya in the year 2019. He has held many appointments and a few amongst them are; Officer Commanding Operations at No 6 Squadron and No 8 Squadron, Commanding Officer No 8 Squadron, Staff Officer Operations - 1 at the Directorate of Air Operations, Commanding Officer Air Defence Command and Control Centre from 2007 to mid-2008 and subsequently became the Overall Operations Commander-Air Defence in November 2008, where his tenure is marked in the SLAF history for shooting down two terrorist aircraft of the LTTE. He commanded three Air Bases and subsequently became Commandant SLAF Academy China Bay in year 2015. In year 2017 he was appointed as Director Training at Air Force Headquarters and subsequently became Director Administration in year 2018. In addition to above appointment, he was appointed as Director Air Operations in July 2019 and currently holds both appointments of Director Air Operations and Director Administration.

In his academic qualifications, Air Vice Marshal PDKT Jayasinghe has completed his first Master’s degree (Defence Studies) in Management with “Merit Pass” from Kotelawala Defence University in 2005. In 2009/10 he followed the Armed Forces War course at prestigious National Defence University in Pakistan and colourfully graduated with “A” grading in MSc (War Stu & Def Mgt). He has followed National Defence Course at National Defence College Bangladesh and graduated with Master of Security Studies (MoSS) with the distinguished title ndc in 2012. He had successfully completed a 4 year LLB degree at Open University Colombo and was awarded Bachelor of Laws degree in April 2013. He also attended courses on Comprehensive Security Response for Terrorism in Hawaii USA, Defence Orientation Course in Netherlands and Basic Staff Course and Flight Safety Officers’ Course in Pakistan. He has visited many countries across the continents including Europe, Africa, Middle East, China, Ukraine, Russia and USA.

Air Vice Marshal PDKT Jayasinghe is married to Mrs. Sandhya Jayasinghe and they are blessed with two daughters and a son.
Group Captain Dissanayake, received his education at St. Peter’s College, Colombo and joined the Sri Lanka Air Force through Kotelawala Defence Academy in year 1991 to start his carrier as a pilot. He is from the helicopter stream and flown Mi-24 Attack Helicopters and Bell-212/412 VVIP helicopters.

He has taken part in all air operations since 1995 till end of the conflict in 2009 accumulating nearly 12 years of operational flying in the war. He is conferred with six gallantry medals in recognition of his bravery in air operations in the war against terrorists.

In addition, he has commanded SLAF Establishments and Flying Squadrons including the prestigious VIP Helicopter Squadron of the SLAF.

He holds a bachelor’s degree from the Kotelawala Defence Academy and two Masters’ degrees in Operational Art and Strategic Studies from Air University USA and National Defence University Pakistan. He’s a graduate of Air Command and Staff College of US Air Force.

In addition to the flying carrier, he’s a research person in the fields of Air Power, International Security, Counterterrorism and Counterinsurgency where he has written extensively on these subjects. His research paper titled “Algorithms for Air Strategy in Counterinsurgency: Case Study of Sri Lanka” was published in Air Power Journal of Pakistan Air Force in year 2104.

Further, he is an orator who has presented papers on Air Power and Counterinsurgency in both national and international defence forums.

He is an alumni of Geneva Center for Security Studies in Switzerland and a Fellow of Air War College Pakistan.

Further, he has pursued in the field of Information Technology too, where he received his accreditations from Australian Computer Society and University of Moratuwa.
Squadron Leader Shyam Ranasinghe is a product of Ananda College, Colombo and joined the SLAF through the Kotelawala Defence University in 2002. He is currently an operational pilot at No 8 Light Transport Squadron since 2017. He completed his basic and advanced flying training and won the prestigious Air Vice Marshal ER Amarasekera Challenge trophy for the Best Flight Cadet. He then took up operational flying on F 7BS, F-7GS, MiG 23 and MiG 27 fighters. He has been awarded with the Weera Wickrama Vibhushanaya and bar, Rana Wickrema Padakkama and bar and Rana Sura Padakkama and bar for acts of gallantry. Sqn Ldr Ranasinghe graduated from the Junior Command and Staff College, SLAF Academy China Bay in 2013 securing four awards including Best All Round Officer, Best in Academics and Best in Public Speaking. Sqn Ldr Ranasinghe is also a graduate of the Air Force Command College, PLAAF Beijing China with a Master’s Degree in Military Studies. He is also engaged in a number of literary activities outside of professional writing.

Squadron Leader KGRI Perera is a product of DS Senananyake M.V, Colombo and joined the SLAF in 2001. He is currently holding the Acting Commanding Officer appointment of No 5 Fighter Squadron and overlooking Commanding Officer’s duties of No 10 & 12 Fighter Squadrons since August 2019. He completed his basic and advanced flying training and won the prestigious Air Vice Marshal ER Amarasekera Challenge trophy for the Best Flight Cadet. He then took up operational flying on F 7BS, F-7GS, MiG 23 and MiG 27 fighters. He has been awarded with the Weera Wickrama Vibhushanaya and bar, Rana Wickrema Padakkama and bar and Rana Sura Padakkama and bar for acts of gallantry. Sqn Ldr Perera graduated from the Junior Command and Staff College, SLAF Academy China Bay in 2012 securing awards including Best All Round Officer, Best in Academics and Best in Public Speaking. Sqn Ldr Perera is also a graduate of the Air Force Command College, PLAAF Beijing China with a Master’s Degree in Military Studies. He is also engaged in a number of literary activities outside of professional writing.
The Asymmetric Threats: A Weak Actor’s Perspective and Responses for an Air Force

By Air Commodore Il Kuttappa

Abstract

The recent drone attacks in September 2019 on Saudi Arabian oil producing facilities brought into focus the extent and vast scope of emerging threats in the sub conventional domain with both state and non-state actors using asymmetric tactics, weapons and methods in the aerial domain to achieve their tactical / strategic objectives. These Sub or Non-conventional aerial threats are only increasing in number and becoming more potent and combating these aerial threats is likely to become a major task for conventional air forces (big and small) in the future. In fact, most air forces have not even evolved a tried and tested response mechanism against these sub-conventional aerial threats and almost all expect to use conventional platforms and tactics to counter these threats.

This paper seeks to show, from a weak actor’s perspective, how asymmetric threats in the aerial domain will continue to evolve and what responses should a conventional air forces develop to counter these threats. It will also concentrate on the interplay of asymmetric aerial threats with modern day air power operational tenets such as control of the air, information dominance, precision attacks, effect based operations etc and will also explore the many forms of Asymmetric warfare which apply even to the air domain.

The Asymmetric aerial threat over the last two to three decades has become a predominant challenge to many countries. Technology, infrastructure availability and several innovations by adversaries have fundamentally changed the nature of the battle space. While this sub conventional threat has traditionally been seen as something an army or police force had to deal with, it has manifested itself in the maritime and air domains as well. Therefore it is imperative that air forces facing an asymmetric threat need to adapt and improvise accordingly to provide credible options to their governments and enhance National Security. The paper classifies the aerial asymmetric threats and explores how a weak or non-state actor responds to the strengths of a conventional air force? It is important to understand these responses, for these are the key to a conventional air force developing its future force and organizational structure, training concepts and curriculum to counter this growing threat.
The Officer is an alumnus of the National Defence Academy, Khadakvasla and was commissioned into the fighter stream of the Indian Air Force in 1990. He has flown various variants of the MiG-21 and is also qualified on Surface to Air Guided Weapons. The Air Officer is an alumnus of the ‘Fuehrungs Akademie’ Hamburg, Germany and holds Master of Science and Master of Philosophy degrees in Defence Studies from the Madras University. His important appointments held include Command of a squadron, Directing Staff at the Defence Services Staff College Wellington, Director Intelligence at Air Headquarters, Chief Operations Officer of a fighter and attack helicopter base and as a Senior Specialist in the apex National Security Council Secretariat in New Delhi. The Air Officer has been commended twice by the President of India for gallantry and distinguished service. He is presently commanding an air base.
Abstract

The relative power equation between nations is never static and is influenced by both domestic and international political developments. In order to ensure basic stability and be able to reinforce national priorities in the shifting power equation, a number of middle powers maintain competent military forces. The overall calibre of these military forces is measured, to a certain extent, by the proficiency and skill of the air forces that are critical elements within them. By virtue of the middle power status of these nations, their air forces tend to be small but are crucial to ensuring national security.

This paper will examine the current status of small air forces and evaluate their contribution to national security, in three parts. In order to ensure that the analysis is balanced, it will start by stipulating the factors and capabilities that could be used to classify air forces as large, medium or small. It will then elaborate on the four key elements that will determine the status of the force. In the next part, the paper will explore the three main challenges that small air forces face, which if not carefully address will relegate them to irrelevance. This is the fundamental reason for titling this paper ‘Small Air Forces at the Critical Juncture’. The three challenges-emerging security environment; strategic issues that impact the employment of small air forces; and the fundamental relevance of small air forces—and their sub-sets will be elaborately discussed.

Facing the challenges mentioned above makes the small air forces of the world come to a critical juncture. The last part of the paper will examine the ingredients that are required to ensure the success of small air forces in performing the role required of them within the broader national security calculus.
Sanu Kainikara is the RAAF’s Air Power Strategist at the Air Power Development Centre, Canberra. He is a former fighter pilot of the Indian Air Force (IAF) who retired voluntarily as a Wing Commander after 21 years of commissioned service. He is operational on the MiG-21,-23, and -25, has also flown the Hunter and Vampire fighters, and has flown over 4,000 hours on fighters. Dr Kainikara was the commanding officer of an operational fighter squadron and is a Qualified Flying Instructor (A2), as well as a graduate and Directing Staff of the IAF’s Fighter Weapons School (TACDE).

During active service, Sanu was awarded the Air Force Cross and Commendations from C-in-C EAC, and the IAF Chief of Air Staff. He is also a recipient of the RAAF Chief of Air Force’s Commendation.

Dr Kainikara is the author of 22 books (list attached) and has also written four of the five Chief of Air Force Occasional Papers so far published. He has also published a large number of peer-reviewed ‘Working Papers’ and independent chapters in a number of compilations. He has presented papers at a large number of international conferences and published papers on national security, strategy and air power in various international professional journals. He is also a regular contributor to three internationally recognised political journals.

Sanu is currently an Adjunct Professor in the School of Humanities and Social Sciences at the University of New South Wales. He is the inaugural Distinguished Fellow at the Institute for Regional Security (IFRS) based in Canberra and is also a Distinguished Fellow at the Centre for Air Power Studies (CAPS) in New Delhi.

He is a regular Guest Lecturer at the Military Colleges of USA, Canada, UK, Finland, Turkey, Saudi Arabia, Malaysia, Indonesia, Philippines and New Zealand. He has also lectured at the PLAAF Senior Staff Course in Beijing. Dr Kainikara has been placed on a list of 100 Icons of the Indian Air Force in a recently published book 100 Iconic Air Warriors of India.

Dr Kainikara has been placed on a list of 100 Icons of the Indian Air Force in a recently published book 100 Iconic Air Warriors of India.

Dr Kainikara is a graduate of the Indian National Defence Academy, Defence Services Staff College and the College of Air Warfare. He holds an undergraduate honours degree in Economics and Human Resources and a Master of Science in Defence and Strategic Studies from the University of Madras. His PhD in International Politics was awarded by the University of Adelaide.
Abstract

Since the advent of manned aircraft employment of air power developed from traditional forms of supporting surface forces to independent air operation for strategic effect. With the progress of time and experiencing two World Wars, the generic term ‘Air Power’ adopted widely to identify this as the air force projection capability. Employment strategy of air power became more mature to balance between employment and outcome. Inherent capability of air power is designed to operate surpassing the limitations of surface forces, to conduct operation over large areas unconstrained by geography, time or distance, to bypass physical barriers and permit concurrent non-contiguous operations across the entire theatre of operations. Together, the principles, tenets, and core competencies define air power as a force distinct from surface forces and sub-surface forces.

With the technological development the air power also provides capability to engage a target with precision, discretion and proportion. Therefore, politicians always preferred to have air option especially in politically charged situations primarily to achieve quick victory. Failure to that caused the employment of air power an expensive option with no outcome. Thus, three crucial aspects to be comprehend into the concept of air power. At first, the operational environment needs to be established prior to the employment of air power. Second, define the area of responsibility for air forces which might extend over terrestrial and marine environments. Last but not least, enhance the country’s ability to conduct operations in depth with the support of air power.

Today, all military strategies realize to have a national security strategy to identify the vital and critical contribution of air power to ensure their success. Air power strategies allow air power to be tailored to the ends, ways and means of a whole variety of circumstances. The classical air power theory endorses air power as inherently offensive, manifestly strategic, and necessarily independent. Thus, the concept of employment of air power mainly follows three basic air strategy, counter air operation, anti-surface force operation and strategic air offensive besides combat support air operation which are basically role oriented. Since Gulf War 1991, military strategies comprehended air power to be very expensive war elements which need to be employed in a coordinated manner, timely and precisely. Most importantly it has to be object oriented considering the national security strategy. Therefore, in modern days, the essence of air power enables it to orient its strategy based on objectives which are denial, destruction, deterrence, decapitation, and diplomacy.

Denial strategy is to attack opponents’ military strategy and eliminating military capabilities. Destruction strategy for punishment seeks to raise the costs of resistance to intolerable levels by inflicting pain on the civilian population. An air strategy that attempts to isolate leadership is another strategy commonly referred to as decapitation. Concept of deterrence to ensure national security is the major elements that most nations examine while formulating their security strategy. Finally, air diplomacy is an effective strategy of defending vital national interests, building necessary partnerships, preventing conflict, and expanding national influence.
Denial strategy relates to theory of Robert Pape, a famous political scientist of USA, who believes that air power is best used against fielded forces to either mass them for air attack or disperse them from achieving their objective. General Giulio Douhet, an Italian general and air power theorist was a key proponent of strategic bombing in aerial warfare. He justified civilian punishment through destruction because he predicted that if the aerial attacks were sudden, intense, and continuous enough, wars could be won in a significantly shorter amount of time. Decapitation is to include the theories of John Warden and his supporters, who advocated attacks against leadership related targets. Thomas Schelling’s classic work on deterrence puts forth a general concept of deterrence theory which is not about war but is the art of coercion and intimidation. It is about credibly signaling the power to hurt and inflict pain on a potential adversary as a way to avoid ever having to fire a bullet. Adam B. Lowther, a research professor and director of the Center for Academic and Professional Journals at the Air Force Research Institute (AFRI) endorsed that while all forms of diplomacy are designed to further state interests, air diplomacy is distinguished by the means employed to promote those interests. The paper enlightens further the objective oriented air strategies vis-à-vis air power theorists with examples.

Besides, understanding the present and future operational environment, nature of threat, and future concept of air operations what could be the air options for a small air force will be discussed. Inherently, there are many challenges to implement an air option to achieve national security objective which will be listed later. Finally, the paper will recommend on the mitigating measures to overcome those challenges. Above all, there is a need to provide flexible air option in unison with land and maritime power to compel a change in adversary’s behaviour.
Group Captain Md Zahir Uddin, GUP, acsc, psc got commission in Bangladesh Air Force (BAF) on 31 May 1994 in General Duties (Pilot) branch. He is a fighter pilot and logged 3000 hours plus flying different types of aircraft in BAF. He commanded two operational squadrons successfully and produced many operational pilots on his account. He is an instructor pilot with 1200 instructional flying hours. In his service career, the Group Captain has attended a number of professional courses both at home and abroad like Squadron Officers School (SOS) Course in Air University, USA, Air Staff course in Defense Services Command and Staff College (DSCSC) in Mirpur, Bangladesh, Air Staff course in Air Command and Staff College (ACSC) in Air University, USA. He also participated different visits and programs like LIMA’1997 in Malaysia, Survey the latest version of F-7BG/FT-7BG aircraft in China, International Flight Safety Seminar in Bangladesh, Air Power Seminar in Pakistan. So far, Group Captain Zahir has completed Masters of Science in Military Studies under Bangladesh University of Professionals (BUP) and Masters of Military Operational Art & Science under Air University, USA. In his entire service career, the Group Captain has served in various command, instructional and staff appointments in different capacities like ADC to COAS, Deputy Director Admin Coord, Officer Commanding 5 Squadron, Officer Commanding 25 Squadron, Strategic Planning Officer in Joint Movement Control Center, MONUSCO, Senior Staff Officer to Director of Plans. He has served as Directing Staff in Air Wing of DSCSC. The officer also served BAF Academy initially as Officer Commanding Cadets’ Training Wing and later as Chief Instructor. Currently, he is serving Bangabandhu Sheikh Mujibur Rahman Aviation and Aerospace University (BSMRAAU) as Dean of the Faculty of Aviation Management.
Abstract

This paper examines how developments in artificial intelligence will both challenge and provide opportunities for small air forces. It provides four possible scenarios for the Sri Lankan Air Force based on some circumstances it can control and others that it cannot.

An important theme running throughout stresses how a nation’s national security rests not only on its military but also on its economic prosperity. Even artificial narrow intelligence looms in the short term on the verge of disrupting societies. As such, small air forces can best prepare by advocating for an increased investment in human capital for a number of reasons: it insulates societies against the worst excesses of information warfare while enabling more efficient, affordable airpower. This human-centric approach also reaffirms the wise strategy the nation has taken in seeking reconciliation rather than punishment in healing from its civil war.

An ingenious air force continues to leverage the tradition of using airpower for military and civilian purposes, meanwhile making smart investments in affordable airpower that befits the shift toward the reality that non-state actors, including insurgents, increasingly benefit from the democratization of military technology, thus making legacy systems like fighter aircraft an increasingly risky and costly proposition. The Sri Lankan Air Force of 2035 looks nothing like that of 2019, but it is highly effective at responding to a variety of missions even as its civilian population is inoculated against the destabilizing tendencies of the ever-increasing war of ideas raging on a civilian population increasingly conducting as much of their lives online as offline, all at the mercy of increasingly powerful algorithms.
Dr. Heather P. Venable is an Assistant Professor of Military and Security Studies in the Department of Airpower at the United States Air Force’s Air Command and Staff College. She currently teaches Airpower One and Airpower Two and an elective on the historical experience of combat. She also has co-taught an elective on Close Air Support and has served as the Airpower Two course director. She previously was an Instructor for the Air Command and Staff College’s eSchool of Graduate Professional Military Education where she oversaw the writing of proposals and master’s theses and taught Applied Warfare Studies courses at the Joint Professional Military Education I level. As a visiting professor at the US Naval Academy, she taught naval and Marine Corps history. She graduated with a B.A. in History from Texas A&M University and a M.A. in American History from the University of Hawai’i. She received her PhD in military history from Duke University. She also has attended the Space Operations Course as well as the Joint Firepower Course. Her forthcoming book from Naval Institute Press is entitled How the Few Became the Proud: The Making of the Marine Corps’ Mythos, 1974-1918. Previous work to be published includes “‘There’s Nothing that a Marine Can’t Do’: Publicity and the Marine Corps, 1905-1917” in New Interpretations in Naval History: Selected Papers from the Sixteenth Naval History Symposium and “The China Marines and the Crucible of the Warrior Mythos, 1900-1941” in Crucibles: Selected Readings in U.S. Marine Corps History. She has also contributed articles about airpower and the current Air Force to several online publications, including War on the Rocks.
Abstract

The roles and capabilities of the Self Defence Forces have been evolving since its inception. Initially the USA covered most of the Japan’s air power requirements while the nation was exercising comparatively little air power. During the initial stages after the establishment of Japan Self Defence Forces (JASDF) the USA provided the essential training, cargo, and fighter aircraft from the U.S. military in line with the Mutual Support Agreement (MSA) which was a key component of multi-faceted U.S. support which also included maintenance of the equipment, facilities and training. In the late 1950s, JASDF was requested to take over the primary responsibilities of the national air defense and subsequently the operation of warning radars was shifted over to Japan. In 1958 the SDF executed the first scramble of an on-alert aircraft. The SDF has since developed in terms of systems, operations, and all other aspects of air power. While some capabilities are limited and not all facets of air power are ideal, the SDF has taken on and is increasing the scope of roles such as air defense, ballistic missile defense, international peacekeeping, humanitarian assistance/disaster relief, and search and rescue. In addition, recently JASDF has started activities in the areas of Space Situational Awareness (SSA) and cyber security.

The SDF has improved from exercising very little air power to its current capabilities despite significant challenges in the national security environment, budgetary situation, and the domestic restrictions. By presenting the process by which SDF air power developed, the author will depict the significance of the role it played in each phase of development, the author will further discuss the current issues and ways the SDF is approaching them. For example, military operations are projected to become multi-domain affairs adding space and cyberspace to the land, sea, and air domains. In response to this trend, JASDF is making efforts to acquire capability in the areas of SSA, cyber security. Also, Japan is facing a declining birthrate and aging population, making it critically important to secure sufficient workforce for both the government and the private sector. In response to this challenge, JASDF has opened its doors to female fighter pilots. Finally, through this paper the author will show the necessity to strengthen the cooperation among militaries and air forces in order to properly respond to harsh international security situations in which we find ourselves.
Lt Col Tamura Shunei is the Strategy Instructor at Air Staff College. His academic accomplishments include the graduation from the National Defense Academy with a Major in Public Administration, a Major in International Relations from the school of Waseda University and the Staff and Command Course at Air Staff College.

He has furnished his duties holding many distinguished appointments in different establishments including the appointment as the Group Leader of an Intelligence Section at the Headquarters of the 5th Air Wing, the Planning and Coordination Officer of the School of Defense Sciences at National Defense Academy, at the Planning Section of the Education Division and the Personnel and Education Department of the Air Staff Office prior to his present engagement as the Strategy Instructor of the Air Staff College.


Abstract

Air forces all over the world are struggling with the increasing cost of acquiring and maintaining a basic airpower capability threshold. To become a relevant branch of a nation’s armed services, air forces need to transform themselves into innovative learning organisations that can keep up with the changing security environment and the rapid technological shifts shaping the nature of warfare. This is particularly more applicable for smaller air forces such as the Sri Lanka Air Force, which does not enjoy the levels of resources available at its disposal compared to other air forces. This paper will aim to explore some of the modern strategic and operational dilemmas facing smaller air forces. Within these limitations, this paper will attempt to localise some of these challenges and recommend actions and policies that the Sri Lankan Air Force could consider to retain its relevancy as an important cog in Sri Lanka’s armed forces structure. The paper proposes that the Sri Lanka Air Force increase their capabilities and place more of an emphasis on working with the Sri Lanka Navy to meet security challenges in the maritime domain increasing ‘jointness’ between the two service branches. Tackling the multiple challenges of maintaining a credible air force however, requires a combination of short-term and long-term policy planning to achieve the transformations desired.
Malinda Meegoda is a Research Associate at the Lakshman Kadirgamar Institute of International Relations and Strategic Studies (LKI), the think tank of Sri Lanka’s Foreign Ministry. Malinda is a graduate of the University of Saskatchewan’s International Cooperation and Conflict Studies program (Saskatoon, Canada).

Malinda’s research interest includes nuclear weapons, arms control, disarmament and Non-Proliferation. He has been invited to present on arms control and disarmament issues by organisations such as SIPRI (Stockholm International Peace Research Institute) and The Foundation for Strategic Research. His writings have appeared in a number of major Sri Lankan newspapers, and magazines such as ‘The Sunday Times’, and the ‘Daily Financial Times’. Additionally, his work has been published by South Asian Voices – an online policy platform for strategic analysis on South Asia, hosted by the Stimson Center in Washington, D.C.
Abstract

Indian Ocean region (IOR) is a flash point in global geopolitics in the 21st century. Factors that were traditional in nature such as hegemonic role of strong nations are predominating in the region ever than before. In parallel, non-traditional factors such as transnational crimes are also increasing in the IOR jeopardising the good order among the stake holders. In the future, the stake holders of the IOR, particularly the countries that are having a shore-line would be tasked to conduct policing and initiate preventive action against increasing transnational crimes in the region.

Sri Lanka being an island nation located in the middle of the Indian Ocean (IO) that divide the ocean in to two parts as the Arabian Sea and the Bay of Bengal has become a strategically important place in the maritime domain. Both legal trades and illegal smugglings are transiting through the country as it is the best option available for the interest actors to continue their economic activities. Crimes such as drug trafficking, gunrunning, IUU fishing, and human smuggling are also increasing dramatically. As a result, the role and task of the security sector of the country are increased by many-fold.

In contrary to transnational crimes, natural disasters such as landslides, floods and sea-borne disasters are more likely to increase in the region in years to come. On the other hand, East-West Sea Lanes of Communication (SLOC) is located close to the Southern Coast of the country. These SLOCs are the arteries of the regional and extra regional economies transporting in and out flow of the required resources and products. As a result, more surveillance assets are required in order to ensure the security and safety of the region.

Even though, the Sri Lanka Navy (SLN) has been protecting its vast sea area, the available platforms and capabilities are observed to be insufficient compared to the role it is expected to perform. The Maritime Domain Awareness (MDA) in the region with other navies is essential to find possible ways and means to root out the threats. Moreover, the Continental Margin being claimed by the country is a huge sea area.

In this endeavour, SLN should develop its maritime surveillance capabilities. This includes the introduction of new sensors, equipment and establishing of the Fleet Air Arm. However, in this juncture due to the financial austerity, it is unlikely that SLN can establish a Naval Air Wing single handed. Therefore, the essay will argues that the most appropriate and workable approach is to conduct combined operations by SLN and Sri Lanka Air Force (SLAF). This effort will create an avenue to expand SLN surveillance capabilities. Similarly, the SLAF will be able to use its capabilities to meet the maritime requirement of the nation.

Disclaimer: This paper is based on research study undertaken on personal capacities by the authors and does not represent the official viewpoint of the Sri Lanka Navy.
Rear Admiral YN Jayarathna joined the Sri Lanka Navy as an Officer Cadet in 1986. He completed his Officer Cadet training at Naval & Maritime Academy, Trincomalee, Sri Lanka. Having topped the batch he was selected to undergo International Midshipman Course in Britannia Royal Naval College, Dartmouth UK in 1988/89.

On return, his first appointment was to the Navy’s elite Fast Attack Craft (FAC) Flotilla as an additional officer and over the rest of his career he was associated with FACs as Officer-In-Command, Training Officer, Training Commander & finally as the Flotilla Commander in 2007-2008. He was hand-picked to be the Flotilla’s Training Officer twice; in 1999-2000 and in 2006-2007 by the Command. His experience in fighting asymmetrical threats posed by the separatist terrorist’s sea unit ‘Sea Tigers’ is highly respected in the SL Navy. He had been decorated for gallantry thrice; twice by Rana Wickrama Paddakkama. To compliment his valour, he also holds a Master’s Degree in Defence Studies from University of Kelaniya, Sri Lanka and another Masters in Hydrography from University of Goa, India. He is a Cat ‘A’ qualified Hydrographer.

He was posted as the Defence Adviser to the Sri Lanka High Commission in New Delhi from Dec 2009 to June 2011. His last sea command was an OPV; SLNS Samudura in 2011-12 and he was the Naval Assistant to the Commander of the Navy from 2012-13. From 2013-2016 he was the Commandant of the Naval and Maritime Academy and in 2017 he completed study tenure at National Defence University, Beijing, China. He has authored several articles on maritime issues and has presented papers at several academic and military forums. He had being invited to lecture at the Staff Colleges of India and Sri Lanka, Maritime Warfare Centre in Visakapatnam/India, NAVCIATTES in USA, in ASEAN Regional Forum/ Surabaya and in University of Western Australia, Pakistan Naval War College and at NMF/India.

Presently he is the Director General Training at Naval Headquarters. He is married to Mrs Nishani and blessed with three children. Currently he is reading for his Doctorate.
Commander (G) Priyadarshana Udakumbura, is presently holding appointment as Senior Staff Officer-Foreign Cooperation in Directorate of Foreign Cooperation at Naval Headquarters, Colombo, Sri Lanka. He has joined Sri Lanka Navy as an Officer Cadet of 18th Intake Kothalawala Defense University on 06 August 2000. He followed initial military training at Sir John Kotelawala Defence University and Naval and Maritime Academy Trincomalee, Sri Lanka. He was commissioned on 06 August 2002 as an acting Sub Lieutenant.

He has graduated from Kotelawala Defence University in Management and technical Sciences stream. Obtained second class upper division in English medium (fulltime). He completed his Sub Lieutenant Technical Course in India (2004-2005). He has completed AB-Initio Observer Course in INS Garuda Naval Base, Kochi, India in 2009 and has obtained qualification as a qualified naval air observer for Dornier Air craft. In 2012, he has attend for his Long Gunnery course in INS Dronacharya, Naval Base, India. He obtained his staff qualification from Defence Services Command and Staff College, Sri Lanka with ‘Golden Owle’ trophy for the first in order of merit and obtained Master of Science in Strategic and Defence Study stream in year 2015 from Kotelawala Defence University, Sri Lanka in English medium. He followed Commanding Officer designation Course in Malaysia (2015) as a pre command course. He Joined Joint Services Command and Staff College, UK for his second psc and obtained Master of Arts in Defence Studies from Kings’ College London in 2017. He has further obtained CMI Level 7 Extended Diploma in Strategic management and Leadership from Charted management institute, UK in 2017 and he has been awarded the designation of ‘Charted Fellow’ from CMI, UK for his postgraduate.

During the 19 years of unblemished naval career, officer has served many Sea and land appointment such as Officer in Command of Fast Attack Craft, officer In Charge of Gunnery School-Naval and Maritime Academy, Gunnery Officer on board ship SLNS Nandimithra, Fleet Gunnery Officer and Directing Staff-Junior Naval Staff College, Sri Lanka. Further, officer was awarded ‘Rana Sura Paddakkama’ twice for his bravery.

In his personal life, he is married to Dilani Gunasinghe by profession Sri Lanka Administrative Service officer and blessed with two sons Dinujaya and Venujaya.
Abstract

There is no exemption to all air forces in the world for challenges created by contemporary geopolitical and economic milieu irrespective their size and capabilities. Thus, they are trying to optimise their capabilities and operations to meet the national security concerns while enduring to field of new capabilities. Small air forces, who are consisted with balance capabilities, but are limited in the depth (size and capacity) are the most affected force due to the recession in resource availability. Supplementary, the challenges for security have obliged nation-states to readjust their policies in national security that sequentially make it relevance to air forces to also reappreciate their strategies. A competent air force is built on a number of fundamental pillars that are critical to its well-being. A critical pillar, one that cannot be substituted with anything else, is a skilled workforce able to operate and function at the leading edge of technology. Air power today, more than ever before, is based on the ability to create an air force that can employ and sustain modern air systems. This is a major undertaking requiring a number of disparate elements and components within the national power equation working in close conjunction with each other, and requires coordination at the highest levels of national security decision-making. Only a professional and effective air force stemming from a substantial technology base can achieve this sophisticated outcome. Air power is increasingly the military power of first choice of western nations in settling international disputes. Air forces, therefore, must develop their members to the highest order of professional mastery to ensure they can generate the required effects at all levels of conflict. Professional mastery must pervade the individual and the organisation at all levels if an air force is to establish its credibility as a force of strategic relevance. Therefore, this paper has discussed an approach for small air force to cope up said challenges through the professional development of airmen to continue as a valid and essential component within the broader national security imperatives. Education is a cornerstone to professional mastery. The professional mastery of an air force forms an integral part of nation-building by assuring air power’s ability to secure the national interest in concert with other parts of national power. An air force that has achieved the highest level of professional mastery can offer greater fidelity to the options presented to government in times of crisis.
Air Vice Marshal WMKSP Weerasinghe who is a proud product of the Ananda College Colombo is a graduate of the General Sir John Kotelawala Defence University with a first class pass becoming the first in order of merit of his batch and was commissioned as a Pilot Officer in the Logistics branch of the Sri Lanka Air Force on 23rd June 1989. During his career in the SLAF, he had held many key appointments such as the Command Procurement Officer, Commanding Officer Supply & Maintenance Depot, Director Budget, Director Logistics, Director Welfare and Director Training. At present he serves in the capacity of Director Logistics. As an operational helicopter pilot from 1996 to 2001, he had flown Bell 206, Bell 212 and Mi 17 Helicopters. In addition, he was the Acting SLAF Media Spokesman from time to time. He is the Chairman of SLAF Wrestling since 2010 and was the Defence Services Wrestling Chairman from 2013 to 2016 and again holding the same secondary appointment from 2019 to 2020. In addition, he is a member of the Curriculum Development Board of the National Defence College of Sri Lanka.

He became the first in order of merit of the 12th Junior Commanders Course at the Junior Command and Staff College SLAF Academy China Bay. He had also followed training courses on Storage Management, International Purchasing, Purchasing Management, and Materials Management, Catering, Aviation Fuel Quality Control and Management and Leadership Development at various local institutes.

He was trained as a pilot at the Indian Air Force Academy Hyderabad, Palam Air Force Base, New Delhi and Sonegaon Air Force Station, Nagpur in India. He is a graduate of the Faculty of Advanced Logistics, Air Force Administrative College, Coimbatore, India. He followed the 45th Basic Staff Course at the Basic Staff School at the Pakistan Air Force Base, Peshawar. He is also a graduate of the prestigious Defence Services Staff College, Wellington, India. He has followed the Financial Management Staff Officer Course at the Keesler AFB USA as well. He has followed Aviation Fuel & Lubricants Management Course at the Indian Oil Corporation Training Centre Mumbai India and Higher Defence Management Course at the College of Defence Management Secunderabad India.

Air Vice Marshal WMKSP Weerasinghe has obtained his Master of Arts in Financial Management degree with a merit pass from the Rajarata University, Sri Lanka and the Master of Business Administration degree from the University of Colombo. The MSc (Defence & Strategic Studies) University of Madras India, the Master of Management Studies Degree from the Osmania University of Hyderabad, the Post Graduate Diploma in International Relations from the BCIS and the Diploma on ICT for Cooperative Communication from the University of Stockholm, Sweden are among his numerous academic accomplishments. He is a life member of the Institute of Supply & Materials Management and Institute of Management of Sri Lanka.

During his distinguished military career for over 30 years, he has been awarded with Uttama Seva Padakkama, Long Service Medal and Clasp, Poorna Bhoomi Medal, SLAF 50th Anniversary Medal, North & East Operations Medal and Clasp, East Humanitarian Operations Medal, North Humanitarian Operations Medal, 50th Independence Anniversary Commemoration Medal and Riviresa Campaign Service Medal.

He is married to Bernadine and blessed with sons; Shakthi Yasas and Gagana Yasith.
Wing Commander Prasanna Liyanaarachchi was born in 13 January 1979. He joined the Sri Lanka Air Force as an Officer Cadet on 23 September 1998 and was commissioned as Pilot Officer in the Logistics Branch on 10 December 2000.

The officer has attended different professional courses in Sri Lanka and abroad. He passed Staff College with DSCSC Course No 10, was honoured with the coveted Golden Pen for the best Commandant’s Research Paper. He was also adjudged the Most Outstanding Student Officer of the Air Wing and was awarded the Golden Owl award. He also had the distinction of being included in the Commandant’s Honours List. He has had a more diverse professional experience and his professional disposition is reinforced with impressive post graduate qualifications, namely; BSc (Defence Studies) in Management with Second Class Upper Pass and MSc (Defence and Strategic Studies) from Kotelawala Defence University, MSc in HRM with Merit Pass from University of Colombo, MBA from Oxford College of Business, Pg Dip (Security and Strategic Studies) from National Defence University Malaysia. Further, he is a life member of the Institute of Certified Management Accountants Australia.

At present he serves as Directing Staff at Defence Services Command and Staff College Sapugaskanda.
Evolving Dynamics of the Air Support Needed by the Land and Naval Forces to Deliver National Military Objectives of Sri Lanka

By Major General PR Wanigasooriya

Abstract

The post conflict realities necessitate Armed Forces of Sri Lanka to right size appropriately to deliver national military objectives and ensure national security. Being a developing country economic concerns take centre stage and hence the force restructuring will have to be done in a constrained environment giving priority to other aspects of economic development. However, the country’s geographic and demographic realities along with current regional and global strategic environment indicate that sufficient focus need to be maintained on safeguarding national security interests as it forms the foundation upon which everything else could be developed.

This paper attempts to offer an insight on dynamics of the use of airpower from an Army perspective. It takes into consideration the Strategic, Operational and Tactical Air Support that would be needed by the Land and Naval forces in the joint effort of tri services towards achieving national military objectives of Sri Lanka. It also discusses some facets of Air Power application before shedding light on National Military Objectives of Sri Lanka and identifying possible future roles of the Sri Lanka Air Force.

The role of the Air Force will encompass multifaceted functions such as assisting SL Navy during blue water operations, assisting SL Army during land operations, peacekeeping or peace enforcement missions as part of delivering our national obligations, disaster management and search and rescue activities during natural or manmade disasters, and maintaining a strong air defence to deter possible current or future threat. In addition, as argued in the paper, the Air Force will have to prepare itself to maintain limited air superiority, possess ability for strategic intervention over limited distances for limited durations, humanitarian intervention if it becomes necessary as part of a coalition or on its own, protection of energy and economic resources within the territorial boundaries of the country, and surveillance as part of supporting foregoing functions.

After discussing strategic effects of air power application and national security concerns, the paper concludes that it is time for the SLAF to put together a blueprint for building a credible strategic aerial intervention capability in all aspects including operation other than war over the next decade and beyond.
Major General Ruwan Wanigasooriya assumed duties as the Commander Security Forces - Jaffna on 15 July 2019. He is a proud product of Ananda College Colombo and enlisted in the Regular Force of the Sri Lanka Army in year 1985. After, successfully completing military training at the Sri Lanka Military Academy Diyatalawa and Officers’ Training School Pakistan, he was commissioned in the rank of Second Lieutenant and was posted to Sri Lanka Artillery in year 1986. Since then he counts over 33 years of service in the Sri Lanka Army.

During the long career he has served in numerous Command, Staff and Instructional appointments at various levels, which include all commands up to Infantry Division, Staff positions in Field Formations, Army Headquarters and the Joint Services Headquarters, and service as an Instructor at several Officer Training Establishments including the Kotelawala Defence University and Defence Services Command and Staff College, Sapugaskanda. 

He has performed duties as the Second in Command of 8 Sri Lanka Artillery Regiment and the Commanding Officer of 6 Sri Lanka Artillery Regiment. He commanded 512 Brigade in year 2007 and 653 Brigade in year 2010, during and after the Humanitarian Operations. Before being appointed as the Commander Security Forces - Jaffna, he commanded the 59 Division in Mullaitivu.

Major General Ruwan Wanigasooriya has held special appointments as Military Assistant to the Commander of the Sri Lanka Army and United Nations Military Observer in the Democratic Republic of Congo. He has performed duties as the General Staff Officer I (Operations) at 55 Division in Wanni in year 1997 and 51 Division in Jaffna in year 2004. He served as the Director Training at Army Headquarters from year 2010 to year 2012 playing an effective role in preparing the Army to face post conflict challenges of training in multidimensional fields. He also served as the Military Spokesman and Director, Media Centre for National Security of the Ministry of Defence from year 2012 to year 2014. Further, he served as the Director Operations and Systems at the Office of the Chief of Defence Staff in year 2015. Presently in addition to other duties he holds the appointment of Chairman, Sri Lanka Army Cricket Committee.

Among his numerous military and academic trainings, the Infantry Young Officers’ Course in Pakistan, Artillery Young Officers’ Course and Advanced Gunnery Course in India, the Potential Observer and Staff Officers’ course( Prior to being appointed as a United Nations Military Observer), Masters Degree in Military Art and Science from the United States Army Command and General Staff College in Leavenworth, Kansas , Master’s in Strategic Studies in year 2016 at the National Resilience Institute (Lemhannas) of the Republic of Indonesia and the Master’s Degree in Management Studies from the General Sir John Kotelawala Defence University are most distinguishable.

Major General Ruwan Wanigasooriya possesses a clean and an unblemished record of conduct and is decorated with Vishishta Seva Vibhushana and Uththama Seva Padakkama.

He is married and blessed with two sons and a daughter.
An Air Diplomacy Policy for Sri Lanka: Formulating and Implementing a Two-Tier Strategy
By Mr. George I. H. Cooke

Abstract

The intrinsic patterns of history which resulted in the rise and fall of states have seen a significant development throughout the 20th century as air travel intensified and progressed to its current level of operation. The ability to cross regions and continents in shorter periods of time dramatically altered the practice of diplomacy itself. Whilst diplomats played a critical role for centuries as the emissaries of leaders, who rarely or never met, increased and enhanced air travel has enabled an intensification of connectivity at the highest level, resulting in the diplomat needing to evolve and for the practice of diplomacy to become more indepth and specialized.

Amidst these vast strides in diplomacy and transportation, the Air Power of states has grown significantly allowing for its use in times of emergency and need, as well as during conflict. This paper attempts to focus on Air Diplomacy and its usage, and thereby argue its paramount relevance for an island nation, such as Sri Lanka. Given that connectivity and defence are the basic tenants upon which states like Sri Lanka have survived for millennia, this paper examines the rationale for Air Diplomacy to be formulated and implemented through a two tier strategy. It is argued that an Air Diplomacy Policy, once implemented, would generate new opportunities for Sri Lanka in general, while increasing the potential of the Sri Lanka Air Force and boosting the foreign policy of the country in particular.

The adoption of an innovative Air Diplomacy policy needs to be rationalized on two levels, at the bilateral and multilateral levels, with two categories of interaction identified at each level. The identification of critical areas of governance and the incorporation of strategy to achieve overarching objectives in these specified areas ensures the creation of a state which can harness opportunities, develop industry, prosper people and equally importantly, increase its presence and influence on the world stage. All nation states, irrespective of their size, location or resources, look to enhance their potential and power. Formulating and implementing a comprehensive Air Diplomacy Policy is one such sphere of significance. It augurs well for defence, strengthens foreign policy, boosts diplomacy and increases connectivity.

This could be done primarily in the bilateral sphere whereby Sri Lanka utilizes her strong bilateral connections with strategic countries in the region and beyond, and secondly at the multilateral level, whereby Sri Lanka plays a vigorous role in redefining defence cooperation through Air Diplomacy. Both levels provide the country and the Sri Lanka Air Force with the opportunity of branching out and creating another highly valued platform for cooperation which would augur well for the state in the long run.
George I. H. Cooke is Deputy Director of the Bandaranaike Centre for International Studies (BCIS). He is a Visiting Lecturer at the University of Colombo, the Bandaranaike International Diplomatic Training Institute, the Junior Command and Staff College, China Bay and the Defence Services Command and Staff College, Sapugaskande. His areas of research interest include foreign policy, diplomacy, regionalism and integration.

Possessing a Bachelor of Arts Degree in Social Sciences from the Open University of Sri Lanka and a Master of Arts Degree in International Relations from the University of Colombo, he is currently a Doctoral Candidate at the University of Colombo. He has presented papers on Foreign Policy, Buddhist Diplomacy, Air Diplomacy and Regionalism at Universities in China, India, Indonesia, Sri Lanka and the United Kingdom.

A former diplomat of the Sri Lanka Foreign Service for a decade from 2007 to 2017, during which time his career at the Ministry of Foreign Affairs, saw him serving in the East Asia and Pacific Division, the Public Communication Division and the Bureau of the Minister of Foreign Affairs, in addition to the Embassy of Sri Lanka in Paris and at the Permanent Delegation of Sri Lanka to UNESCO.

An alumnus of the Netherlands Institute of International Relations, Clingendael, in The Hague, he was a Visiting Fellow at the Ubon Ratchathani University in Thailand.
Abstract

Air Power plays a vital role in the present world context in all levels of symmetric or asymmetric warfare. With the modern development and advancement of technology, any type of state or non-state actors is in position to acquire Air Power capabilities to deliver the intended threat in the medium of air. Therefore it is the task and responsibility of the Air Forces of any nation to be armed and prepared to face potential challenges in terms of National Security and even Regional Security. In such scenario it is paramount important for the countries with Small Air Forces to be geared and prepared to face the pursue challenges of natural and manmade in order to ensure the national security. Also it is healthier for countries with small Air Forces to prevent form potential threats being well prepared, equipped and trained to give sound signal to the counterparts.

This paper will discuss on the main threats to the national and regional security in the Indian Ocean Region in order to understand and evaluate them easily. Having understood the threats the paper further discuss on how important the Aviation as a tool to maintain stability of a country and beyond, How collaboration of regional countries Aviation would contribute to achieve different goals, Using different roles of Aviation to accomplish special missions, main types of aerial platforms customised for the security and sustainability of Indian Ocean Region, The importance of training the pilots and Engineers in order to meet these mission requirements and finally how the stable countries support the countries in need in the region or beyond in terms of Air Power.

Looking at the challenges facing by countries with small air forces whilst giving special emphasis to IOR and looking at the counter measures from a big brother’s perspective would certainly help the small Air Forces to forecast their future goals and architect their visions accordingly. In conclusion Russia as a country with the greatest experience of military technical cooperation with countries of Indian Ocean demonstrates own position to support for developing Air Forces of regional countries.
Colonel Zatsepilin Aleksandr Valentinovich is presently performing as the Chief of the Russian Space and Air Force Central RD Institute. He is a graduate from N. Zhukovsky Engineering Air Force Academy. He performed his military duties in Engineering Air Force Academy and the Russian Armed Forces General Staff.

Colonel Zatsepilin Aleksandr Valentinovich rewarded with number of military awards including the medal of order “For the Merit for the Motherland” and medal “For the Martial Valour”.

Colonel ZA Valentinovich
The Chief
Russian Space and Air Force Central RD Institute
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AACC</td>
<td>ASEAN Air Chiefs Conference</td>
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<tr>
<td>AACS</td>
<td>African Air Chiefs Symposium</td>
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<tr>
<td>AD</td>
<td>Air Defence</td>
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<td>AFHQ</td>
<td>Air Force Headquarters</td>
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<td>AFRI</td>
<td>Air Force Research Institute</td>
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<tr>
<td>AI</td>
<td>Artificial Intelligence</td>
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<tr>
<td>ASEAN</td>
<td>Association of South East Asian Nations</td>
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<td>BCIS</td>
<td>Bandaranayake Centre for International Relations, Sri Lanka</td>
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<tr>
<td>BIMSTEC</td>
<td>Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation</td>
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<td>CAS</td>
<td>Colombo Air Symposium</td>
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<tr>
<td>CONJEFAMER</td>
<td>Conference of the American Air Chiefs</td>
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<tr>
<td>DSC&amp;SC</td>
<td>Defence Service Command and Staff College</td>
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<td>FCAS</td>
<td>Future Combat Air System</td>
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<td>GDP</td>
<td>Gross Domestic Product (GDP is the monetary value of all finished goods and services made within a country during specific period)</td>
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<td>HADR</td>
<td>Humanitarian Assistance and Disaster Relief</td>
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<tr>
<td>HADR</td>
<td>Humanitarian Assistance and Disaster Relief operations</td>
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<tr>
<td>IAF</td>
<td>Indian Air Force</td>
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<td>IED</td>
<td>Improvised Explosive Device (IED is a bomb constructed and deployed in ways other than in conventional military action)</td>
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<td>ISIS</td>
<td>The Islamic State of Iraq and the Syria</td>
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<tr>
<td>ISIL</td>
<td>also known as the Islamic State of Iraq and Levant</td>
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<tr>
<td></td>
<td>Officially known as the Islamic State (IS)</td>
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<tr>
<td>ISR</td>
<td>Intelligence, Surveillance and Reconnaissance</td>
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<td>KDU</td>
<td>Kotelawela Defence University</td>
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<tr>
<td>LKI</td>
<td>Lakshman Kadirgamar Institute, Sri Lanka</td>
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<td>NIDS</td>
<td>National Institute for Defense Studies</td>
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<tr>
<td>PAF</td>
<td>Pakistan Air Force</td>
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<tr>
<td>QHI</td>
<td>Qualified Helicopter Instructor</td>
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<td>RAF</td>
<td>Royal Air Force</td>
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<tr>
<td>RAAF</td>
<td>Royal Australian Air Force</td>
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<td>Abbreviation</td>
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<tr>
<td>RSP</td>
<td>- Rana Sura Padakkama (Combat Excellence Medal)</td>
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<td>RWP</td>
<td>- Rana Wicrama Padakkama (Combat Gallantry Medal)</td>
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<td>SDM</td>
<td>- Self Defence Force</td>
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<tr>
<td>SCO</td>
<td>- Shanghai Cooperation Organisation</td>
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<tr>
<td>SICOFAA</td>
<td>- System of Cooperation among the American Air Forces</td>
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<td>SLAF</td>
<td>- Sri Lanka Air Force</td>
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<td>SLOC</td>
<td>- Sea Line Of Communication</td>
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<td>UAVs</td>
<td>- Unmanned Aerial Vehicles</td>
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<tr>
<td>USP</td>
<td>- The Uttama Sava Padakkama (Meritorious Service Medal)</td>
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<tr>
<td>WWII</td>
<td>- World War II</td>
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<tr>
<td>WWV</td>
<td>- Weera Wicrama Vibhushanaya (Heroic Gallantry Decoration)</td>
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Aerial Surveillance - the gathering of surveillance, usually visual imagery or video, from an airborne vehicle—such as an unmanned aerial vehicle, helicopter, or spy plane.

Air Defence - the means, techniques, and organizations devoted to preventing or minimizing the effects of attack by enemy aircraft or guided missiles.

Air Space - the portion of the atmosphere controlled by a country above its territory, including its territorial waters.

Al Qaeda - Al-Qaeda is a militant Sunni Islamist multi-national organization founded in Peshawar Pakistan, 1988 by Osama bin Laden, Abdullah Azzam, and several other Arab volunteers during the Soviet–Afghan War. Al-Qaeda operates as a network of Islamic extremists and Salafist jihadists.

Algorithms - In mathematics and computer science, an algorithm is a sequence of instructions, typically to solve a class of problems or perform a computation. Algorithms are unambiguous specifications for performing calculation, data processing, automated reasoning, and other tasks.

Anti-piracy - designed to prevent or thwart piracy at sea

Artificial General Intelligence (AGI) - the intelligence of a machine that has the capacity to understand or learn any intellectual task that a human being can. It is a primary goal of some artificial intelligence research and a common topic in science fiction and future studies.

Artificial Narrow Intelligence (ANI) - (Narrow AI) is a specific type of Artificial Intelligence in which a technology outperforms humans in some very narrowly defined task. Unlike general artificial intelligence, narrow artificial intelligence focuses on a single subset of cognitive abilities and advances in that spectrum.

Asymmetric wars - Asymmetric warfare is war between belligerents whose relative military power differs significantly, or whose strategy or tactics differ significantly. This is typically a war between a standing, professional army and an insurgency or resistance movement militias who often have status of unlawful combatants.

Cambridge Analytica - Cambridge Analytica Ltd was a British political consulting firm which combined data mining, data brokerage, and data analysis with strategic communication during the electoral processes.

CASEVAC - evacuation of casualties by air

Catastrophes - an event causing great and usually sudden damage or suffering; a disaster.

Civil War - a war between citizens of the same country

Cold War - The Cold War was a state of geopolitical tension between the two primary World War II victors, the Soviet Union and its satellite states, and the United States.

Colonization - the action or process of settling among and establishing control over the indigenous people of an area.

Contraband - Contraband refers to goods that are taken into or out of a country illegally.

Deepfakes - a technique for human image synthesis based on artificial intelligence. It is used to combine and superimpose existing images and videos onto source images or videos using a machine learning technique known as generative adversarial network.

Disaster Relief - the process of responding to a catastrophic situation, providing humanitarian aid to persons and communities who have suffered from some form of disaster. It involves dealing with and avoiding risks and preparing, supporting, and rebuilding society when natural or human-made disasters occur.

Effects Based Operations’ (EBO) - Effects-based operations (EBO) is a United States military concept that emerged during the Persian Gulf War for the planning and conduct of operations combining military and non-military methods to achieve a particular effect.

EW systems - Electronic warfare is any action involving the use of the electromagnetic spectrum or directed energy to control the spectrum, attack an enemy, or impede enemy assaults.
First Respondents - a person with specialized training who is among the first to arrive and provide assistance at the scene of an emergency, such as an accident, natural disaster, or terrorist attack.

Geopolitical - relating to politics, especially international relations, as influenced by geographical factors.

Geo-strategic - relating to the strategy required in dealing with geopolitical problems.

Hezbollah - Hezbollah—also transliterated Hizbullah, Hizballah, etc.—is a Shia Islamist political party and militant group based in Lebanon.

Humanitarian Aid - material and logistic assistance to people who need help.

Hyperwar - enhancements to existing systems as well as revolutionary approaches to conflict.

Jointness - Cross-service cooperation

Kamikaze - Kamikaze “divine wind” or “spirit wind”, officially “Special Attack Unit”), a unit of military aviators who initiated suicide attacks for the Empire of Japan against Allied naval vessels in the closing stages of the Pacific campaign of World War II

Longue Durée” approach - Longue Durée, or long term, is an approach to history writing pioneered by historians of the Annales School such as Fernand Braudel. It focusses on events that occur nearly imperceptibly over a long period of time, on slowly changing relationships between people and the world.

LTTE Air Tigers - The Air Tigers was the air-wing of the Liberation Tigers of Tamil Eelam (LTTE)

MEDEVAC - the evacuation of military or other casualties to hospital in a helicopter or aeroplane.

Modus operandi - Method of working

Mojave Desert - The Mojave Desert is an arid rain-shadow desert and the driest desert in North America. It is in the North American Southwest, primarily within southeastern California and southern Nevada, and it occupies 47,877 sq mi.

OODA loop - The OODA loop is the cycle observe–orient–decide–act, developed by military strategist and United States Air Force Colonel John Boyd.

Plethora - a large or excessive amount of something

Precision Guided Munitions (PGMs) - A precision-guided munition (PGM, smart weapon, smart munition, and smart bomb) is a guided munition intended to precisely hit a specific target, to minimize collateral damage and increase lethality against intended targets.

Quad copter - also called a quadrotor helicopter or quadrotor, is a multirotor helicopter that is lifted and propelled by four rotors.

Radar Cross Section - Radar cross-section is a measure of how detectable an object is by radar. A larger RCS indicates that an object is more easily detected.

Strategize - devise a strategy or strategies.

Super Powers - A superpower is a state with a dominant position characterized by its extensive ability to exert influence or project power on a global scale.

Two tier approach - something that has two levels, one on top of the other.

USS Cole incident - The USS Cole bombing was an attack against USS Cole, a guided missile destroyer of the United States Navy, on 12 October 2000, while she was being refueled in Yemen’s Aden harbor.

WeChat - WeChat is a Chinese multi-purpose messaging, social media and mobile payment app developed by Tencent. It was first released in 2011, and became one of the world’s largest standalone mobile apps in 2018, with over 1 billion monthly active users.

Wizard of Oz - is a 1939 American musical fantasy film produced by Metro-Goldwyn-Mayer. Widely regarded to be one of the greatest films in cinema history, it is the most commercially successful adaptation of L. Frank Baum’s 1900 children’s book The Wonderful Wizard of Oz.

Yemini Houthi rebels - It was believed by the Gulf States that the Houthis had accepted aid from Iran while Saudi Arabia was aiding their Yemeni rivals. On 20 January 2015, Houthi rebels seized the presidential palace in the capital.

9/11 aerial attack - The September 11 attacks (also referred to as 9/11) were a series of four coordinated terrorist attacks by the Islamic terrorist group al-Qaeda.
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