KERIS TERBANG

ISSUE 18 (APRIL - JUNE 2024)

RBAF 63rd Anniversary

Another milestone in RBAF's long-standing history

58 Years of RBAirF

Celebrating 58 years of service, dedication and commitment

Welcoming Visits

Hosting visits from RAAF and RTAF

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EDITOR-IN-CHIEF'S REMARKS

السَّلامُ عليكُمْ ورحْمةُ الله وبَرَكاتُه

بِسْمِ اللهِ الرَّحْمنِ الرَّحِيمِ

Welcome to the 18th edition of Keris Terbang! In this issue, we offer a comprehensive look into the daily lives of the men and women of the Royal Brunei Air Force. Our goal is to showcase the diverse backgrounds, expertise, and professionalism within our unit, providing readers with an insightful perspective.

This edition features a roundup of our yearly activities and key milestones. Highlights include a celebration of the 63rd Anniversary of the Royal Brunei Armed Forces and the 58th Anniversary of the Royal Brunei Air Force. We also delve into our various events and engagements, such as the recent Eid Ul Adha celebrations and our interactions with regional Air Forces. We are excited to share a variety of articles, including educational case studies, technical summaries, and a special piece on fitness for cycling enthusiasts. These stories aim to provide both inspiration and knowledge, reflecting the dedication and hard work of our personnel.

As we continue to grow and achieve new heights, I would like to express my deepest gratitude to my team and all the contributors who have dedicated their time and effort to this magazine's success. Your continued support and contributions of articles, stories, and images are invaluable, and we encourage you to keep sharing your experiences with us.

Enjoy this issue, and let it serve as a reminder of the remarkable achievements and daily efforts of the Royal Brunei Air Force. Together, we strive to inspire and motivate our community.

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KERIS TERBANG ISSUE 18

APRIL - JUNE 2024

HIGHLIGHTS

REGULARS

CELEBRATING EXCELLENCE: MY EXPERIENCE AT THE 63RD ROYAL BRUNEI ARMED FORCES ANNIVERSARY

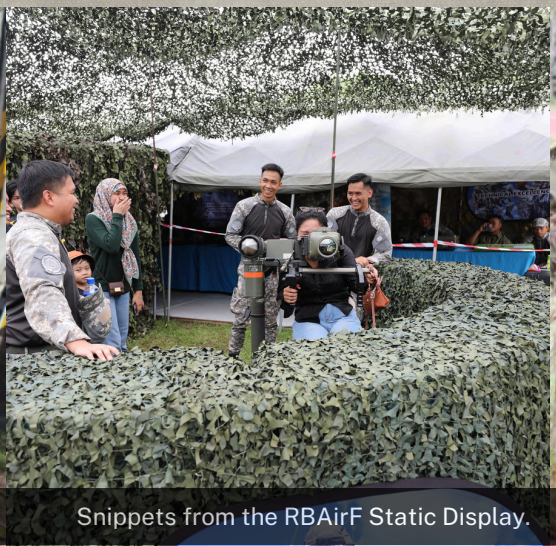
by Maj (U) Azim

The 63rd RBAF Anniversary on 1 June 2024, was a significant occasion that highlighted the dedication and professionalism of all units within our armed forces. RBAF personnel participated in this event were provided a unique opportunity to witness the collective spirit and commitment of our military community.

The day commenced with an atmosphere charged with anticipation and pride. Service members from various units gathered for the military parade, a display of discipline and unity. Observing the synchronised movements and formations, it became clear how much effort had been invested in preparing for this moment. The parade was not merely a ceremonial display but a powerful testament to our readiness to serve and protect our nation.

As an RBAirF personnel, I took immense pride in seeing my colleagues perform flawlessly, knowing the hard work and dedication behind each drill.

Amongst the key highlights of the anniversary was the showcase of air force capability assets, a project that involved meticulous planning and collaboration. The static exhibition aimed to educate the public about RBAirF's roles and responsibilities, emphasising our commitment to both national defence and humanitarian efforts. Organising this exhibition allowed for a meaningful interaction with the community, bridging the gap between the armed forces and the public we serve. The presence of His Majesty the Sultan during the showcase elevated the significance of the event. His visit served as a reminder of the trust and responsibility placed upon the RBAF. Witnessing His Majesty taking an active interest in our capabilities reinforced the commitment of our personnel to uphold the highest standards of service. It was a moment of profound pride for everyone involved.



Snippets from the RBAirF Static Display.

A RBAirF parachutist during the Solidarity Jump with other countries.

His Majesty at the Capability Exhibition.

Female Contingent at the Parade.

Throughout the day, the static exhibition continued to draw in crowds. We had designed interactive displays to allow visitors to get hands-on experience with the technology we use. Children eagerly climbed into cockpit simulators while their parents absorbed the information we shared. These interactions reminded me of the significance of our work: inspiring the next generation and fostering pride in our armed forces. The smiles and questions from young visitors were particularly heartwarming; it was clear that we were igniting a passion for aviation and service in their hearts. Engaging with the public was not just about showcasing our capabilities; it was about building a connection with the community we serve.

Another highlight of the anniversary was the Solidarity Jump event, where RBAirF paratroopers showcased their impressive parachuting skills alongside special forces. This demonstration underscored the RBAirF's exceptional professionalism, their capability to coordinate multinational jumps, and their unwavering commitment to safety. The precision of their execution was a clear testament to the rigorous training and high standards of our armed forces. The camaraderie among personnel from different units was palpable, demonstrating the collective strength of the RBAF. This spirit of collaboration is vital, as it reinforces our commitment to excellence in all that we do.

RBAirF Fly-past Crew.

As the day concluded, reflections on the event underscored the significance of our shared dedication to service. The 63rd RBAF Anniversary was a powerful reaffirmation of our commitment to the nation. Every aspect of the celebration, from the precision of the military parade to the engaging static exhibition, highlighted the professionalism and integrity that define the RBAirF.

Participating in this event reinforced the importance of our mission and the vital role we play in safeguarding our nation. The experiences of that day will stay with me, fuelling my passion for service and inspiring me to contribute even more to our esteemed armed forces. The RBAirF stands ready to protect and serve, embodying the values of integrity, dedication, and professionalism that are the hallmarks of our esteemed armed forces.

RBAirF 58th ANNIVERSARY

RBAirF 58th Anniversary Overall Celebration

By Cpt (U) Azime

On 24 June 2024, marked another milestone for the Royal Brunei Air Force (RBAirF) in celebrating its 58th anniversary since it was formed. This significant milestone highlights the RBAirF's dedication, growth, and impact on the Royal Brunei Armed Forces (RBAF) as a whole. Over the years, RBAirF has achieved remarkable success, making a positive impact in achieving the RBAirF's Vision to Deliver Robust, Responsive and Resource Efficient Air Force and contributing efforts towards the roles of RBAF.

For this year's celebrations, the event began with airmen and airwomen, as well as civilian staff, adorning various RBAirF vocational uniforms for a parade at Hangar B, Rimba Air Force Base (Rimba AFB), followed by the presentation of the Honorary Salute to the Commander of the RBAirF, Brigadier General (U) Dato Seri Pahlawan Mohammad Sharif bin Dato Paduka Haji Ibrahim, led by the Deputy Commander of the RBAirF, Colonel (U) Haji Haszahaidi bin Haji Ahmad Daud. It is an honour to witness yet another remarkable success of the RBAirF's collective efforts in making this year's celebration yet another achievement not only with the success of the parade but yet through the formation of the RBAirF Training Group, and the presentation of the No. 8 Wing Badge to the newly appointed Commanding Officer of No. 8 Wing. Furthermore, the introduction of new engineering uniforms in connection with the RBAirF Anniversary was a key step towards the organisation's growth and advancement.

In addition, what makes this year's RBAirF 58th Anniversary unique is the inauguration of the first RBAirF museum, which houses several decommissioned RBAirF assets which holds a significant history and wonderful memories for the airmen and airwomen that were involved in the past.

A Group Photo with the Guest of Honor.

Finally, to commemorate this momentous occasion, the celebration kicked off with a Gala Night Dinner, bringing together all RBAirF personnel and the evening was blessed even more with the present of the Guest of Honour, His Royal Highness Paduka Seri Major (U) Prince 'Abdul Mateen ibni His Majesty Sultan Haji Hassanal Bolkiah Mu'izzaddin Waddaulah and Her Highness Pengiran Anak Isteri Anisha Rosnah binti Adam.

His Royal Highness and Her Highness Interacting with RBAirF Personnel.

The evening included inspirational speeches, recognition of notable contributors, and a retrospective look at the organisation's history, and complemented by a video presentation. Yet again, this is another wonderful event that not only brings people together from various ranks, vocations, and backgrounds but also illustrates the importance of bringing joy to everyone who attended the event with entertainment and fun games and activities.

The overall celebration of the 58th RBAirF Anniversary demonstrated everyone's support and dedication, and all personnel were encouraged to embrace the RBAirF core values of Service Above Self, Teamwork, and Excellence, which will strengthen the RBAirF's reputation as a credible and effective air force around the world.

The distribution of sacrifical meat to the recepients from Kampong Rimba.

EID UL ADHA 1445H

by Cpt (U) Abdul Aziz

As the RBAF aspires to inculcate one of the most important core values, as seen over the past few years, various religious activities have been regularly conducted. All these activities are performed with the intent and hopes to strengthen the spiritual morale of the men and women in uniform.

Korban and Aqiqah is an annual religious event performed once a year by Muslims all over the world to prescribe as a sign of gratitude to Allah SWT for all His various blessings and also for the permanence of mankind from year to year. This event is held in the month of Zulhijjah which is on Hari Raya Eid ul-Adha and the days of Tasyriq following it. This event also gives opportunity to whom is financially capable to give back to the poor and in need.


The event began with Asar prayer.


Recitation of Takbir Eid Ul-Adha.

Ibadah Korban is deeply rooted in Islamic history and tradition, centered around Prophet Ibrahim (AS), a revered figure considered the father of many prophets, including Prophet Muhammad (SAW). His story, especially his unwavering faith, is commemorated during Eid ul-Adha. According to Islamic teachings, Ibrahim (AS) received a divine command in a dream to sacrifice his only son, Ismail (AS), as a test of faith.

Despite the profound difficulty of this command, Ibrahim (AS) prepared to obey, showcasing his devotion to Allah (SWT). When the moment came, Ibrahim (AS) shared his dream with Ismail (AS), who accepted the divine will with equal faith. As Ibrahim (AS) was about to perform the sacrifice, Allah (SWT) intervened, acknowledging Ibrahim's faithfulness and providing a ram to be sacrificed in Ismail's place. This event is celebrated annually during Eid ul-Adha, reflecting the profound themes of faith, obedience, and divine mercy. The story of Ibrahim (AS) continues to inspire Muslims, reinforcing the values of submission and trust in God's wisdom.

This year, the RBAirF undertook the significant task of organising and executing the Korban and Aqiqah ceremonies, involving the sacrifice of three buffaloes and two goats. The sacrificial meat was distributed to the RBAirF personnel and 24 Asnaf recipients of Kampong Rimba. Although I had previously served as a committee member for similar events, I underestimated the complexities involved in overseeing the entire operation.

My prior experience had led me to believe that I was well-prepared to manage the event independently. However, I quickly realised that the responsibilities and challenges of orchestrating the event from start to finish were far more intricate than anticipated. The process of organising these ceremonies revealed a host of unexpected difficulties, alongside numerous rewarding outcomes.

This experience underscored the considerable difference between contributing to an event as a team member and leading its execution, highlighting both the formidable challenges and the profound sense of accomplishment that accompany such an undertaking.

Despite the challenges encountered, the team successfully conducted the event with remarkable efficiency, ensuring it ran smoothly with only minor hiccups. Initially, the coordinators faced difficulties in attracting participants, receiving minimal interest from both Military and Civilian personnel. This lack of early engagement posed a potential risk to the event's success. However, in the final two weeks leading up to the event, there was a noticeable increase in registrations as more individuals committed to participating in Korban. This last-minute surge in interest required the team to adapt quickly and efficiently, demonstrating their ability to manage unforeseen changes and ensure the event's overall success.

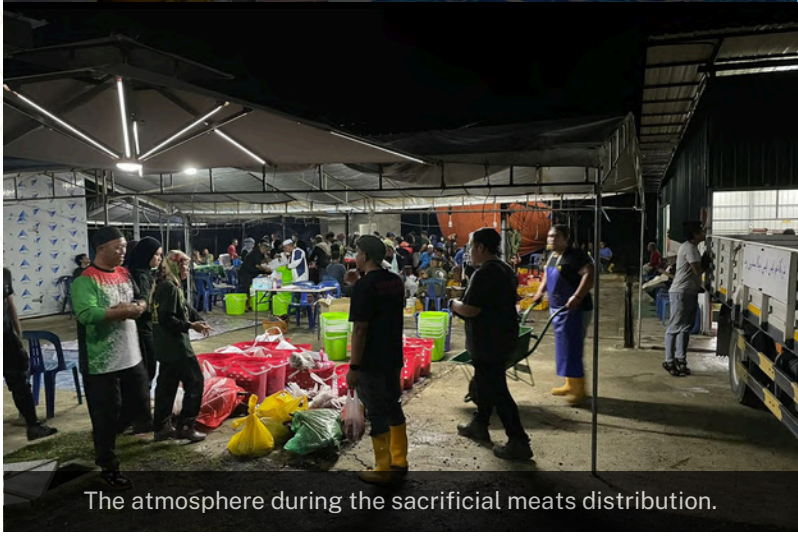
Fatigue Party handling the sacrifical meats.

Collection of sacrifical meats from the supplier.

The distribution of sacrifical meat given to senior officers.

Recipients from Kampong Rimba during the event.

Among the Asnaf recipients from Kampong Rimba.



The atmosphere during the sacrificial meats distribution.

WELCOMING VISITS FROM RAAF AND RTAF

By Lt (U) Dk Rabiatuladawiah

The Royal Brunei Air Force had the distinct honor of welcoming the Chiefs of Air Force from both the Royal Australian Air Force (RAAF) and the Royal Thai Air Force (RTAF) on separate official visits. These occasions underscored the mutual respect and strong partnerships between the RBAirF and its counterparts in Australia and Thailand.

Air Marshal Robert Chipman, Chief of the Royal Australian Air Force (RAAF) had visited the RBAirF from 10 to 22 May 2024, which included a formal reception at the Royal Brunei Air Force (RBAirF) Headquarters, where he was honoured with a salute from the RBAirF Guard of Honour. His itinerary featured a courtesy call to Brigadier General (U) Dato Seri Pahlawan Mohammad Sharif bin Dato Paduka Haji Ibrahim, the RBAirF Commander, followed by the Honorary Pilot Wing presentation. A notable recipient of the Honorary Pilot Wing, given with His Majesty The Sultan's consent, recognises his substantial contributions to strengthening defence cooperation between the RBAirF and the RAAF.

During the visit, Chipman received a briefing on the RBAirF's operational capabilities and future plans, and viewed a static display of the RBAirF's aircraft and equipment. He also engaged in discussions with Yang Berhormat Pehin Datu Lailaraja Major General (Retired) Dato Paduka Seri Haji Awang Halbi bin Haji Mohd Yussof, Minister of Defence II, and Major General Dato Paduka Seri Haji Muhammad Haszaimi bin Bol Hassan, Commander of the RBAF.

Chipman's visit featured a Welcoming Dinner in Jerudong, marked by a traditional 'Silat' performance and speeches from both sides. This event, attended by senior officers and their spouses, highlighted Brunei's rich cultural heritage. The visit included a morning run at Eco-Corridor Park and exploration of Brunei's landmarks and natural beauty, including the Sultan Omar Ali Saifuddien Mosque, Jame' Asr Mosque, and a river cruise featuring Proboscis monkeys.

Air Marshal Chipman's visit underscored the strong bilateral ties between Australia and Brunei, reinforcing collaboration and fostering mutual respect between the RAAF and RBAirF. Through a combination of formal discussions and cultural exchanges, the visit marked a significant step forward in enhancing defence cooperation and understanding between the two nations.

Air Chief Marshal Punpakdee Pattanakul, Commander-in-Chief of the Royal Thai Air Force (RTAF), visited the Royal Brunei Air Force (RBAirF) from 10 to 11 June 2024. His visit commenced with a reception at the RBAirF Headquarters, where he was honoured with a salute from the RBAirF Guard of Honour. During the visit, he made a courtesy call to Brigadier General (U) Dato Seri Pahlawan Mohammad Sharif bin Dato Paduka Haji Ibrahim, the RBAirF Commander, and was awarded the Honorary Pilot Wing with His Majesty The Sultan's consent, in recognition of his efforts in strengthening defence relations between Thailand and Brunei.

Pattanakul's schedule featured a tour of Hangar B at Rimba Air Force Base, showcasing the RBAirF's aircraft and equipment. This tour provided insight into the operational capabilities and readiness of the Brunei air force. He also met with Yang Berhormat Pehin Datu Lailaraja Major General (Retired) Dato Paduka Seri Haji Awang Halbi bin Haji Mohd Yussof, Minister of Defence II, and Major General Dato Paduka Seri Haji Muhammad Haszaimi bin Bol Hassan, Commander of the RBAF.

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A Welcoming Dinner hosted by Brigadier General Mohammad Sharif and Datin Noraidah binti Haji Ibrahim at the Officers' Mess in Bolkiah Garrison featured a traditional 'Silat' performance and speeches emphasising the importance of the RBAirF-RTAF partnership. The evening also included a musical performance by the Royal Brunei Armed Forces band, enhancing the celebratory atmosphere.

Both visits highlighted the deepening defence relations between Brunei and its international partners. They underscored the mutual respect and collaboration between the RBAirF and their counterparts, reinforcing the ongoing commitment to strengthening defence cooperation and understanding between the nations involved.

FEMALE RBAirF PILOT'S PERSEPECTIVE: TRAINING, OPERATIONAL, WORK/LIFE BALANCE

BY LT (U) FATINAH

THE INCLUSION OF WOMEN IN PIVOTAL ROLES IN OPERATIONS UNDERSCORES THE ORGANISATION'S BROADER EFFORTS TO PROMOTE GENDER EQUALITY AND EMPOWER WOMEN ACROSS ALL SECTORS.

Back in 2020, I remember feeling highly inspired how having women serve as military pilots is such a remarkable and inspiring scenario, demonstrating strength, resilience and dedication. The induction of female pilots into the Royal Brunei Air Force (RBAirF) began in earnest in the year 2012 when 854 Major (U) Dk Nurazriana binti Pg Hj Hassanan became the first ever female pilot for the RBAirF reflecting RBAirF's commitment to fostering diversity and cultivating an inclusive environment within its armed forces. Followed by 1063 Captain (U) Norasiah binti Hussin who became the second female pilot four years later.

Representation plays a crucial role in showing that the low numbers of women in the military, particularly in aviation, are not simply due to societal norms but rather not showing enough to young women that stepping foot in the world of aviation is a realistic opportunity. I believe it is important for people to realise that gender is not a limiting factor. Women make capable military members and leaders and we should feel empowered to pursue all types of careers. To date, there are now five female pilots in the RBAirF and the inclusion of women in such pivotal roles in operations underscores the nation's broader efforts to promote gender equality and empower women across all sectors.

Looking back, undergoing pilot training as a mother presents unique challenges and concerns. The moment I accepted this path even before giving birth to my daughter, I was already preparing to strike a strong balance between professional duties and family responsibilities which requires careful planning, task prioritisation and sometimes making difficult choices. Reflecting those days, the road I chose to get to my wings was once a little bumpy and littered with inevitable obstacles. There were times I found myself in difficult situations but that was when I brought myself to look on the bright side. Many times I took it as an opportunity to develop skills to withstand high pressure and exhibit high levels of resilience in preparation to better adapt to the rigorously demanding environment in the operational world. If there was one valuable lesson I could derive from the five-months long course, it would be having the right mindset or way of thinking, tackling almost all daily challenges in any situations becomes less difficult.

Moreover, with a robust support system and network with family and childcare providers who have helped with child-rearing duties especially during night flights and long training sessions, I was able to strategise my way to a successful and smart training plan to meet the required standards of the RBAirF pilot training course. As a mother and a student pilot, without the unwavering support from my husband and family, and invaluable guidance from 73 Squadron highly dedicated instructors, no challenges along my flying training and daily life would have been navigated with poise and determination and this journey would not have been as transformative. Nevertheless, it is critical to me that I continuously drive my family at a swift pace to collectively understand the demanding working environment I will be in once I step foot in the operational squadron. Pilot training was indeed tough yet achievable for it was a long rigorous process that demands dedication, discipline and perseverance to succeed.

Lt (U) Fatinah's flying journey began in Australia where she completed Basic and Intermediate Fixed Wing Training at Air Combat Australia (ACA) with a CT4-E trainer.

Group photo with 73 Squadron highly dedicated instructors, Lt Col (R) Johar and Lt Col (R) Jasmin.

In addition to that, it is through this training course I learnt a lot to sustain a stable work-life balance while juggling responsibilities in the most effective manner possible. Maintaining excellent physical health and mental well-being through regular exercise, a balanced diet, sufficient sleep and stress management techniques has always been vital to me. Flight training can be tough and mentally as well as physically exhausting but the release of endorphins during exercise has helped to increase the feelings of wellbeing, hence managing stress, which allows me to perform my best both at work and home. Ideally, organising timetables by creating a study and practice schedule that balances flight training, ground preparation and personal time also plays a crucial role in improving overall productivity and optimising performance. When not working, it is very crucial that I prioritise quality time with my family.

Balancing a demanding career with motherhood requires a proactive and adaptable approach but with the right strategies, it can be both rewarding and fulfilling. Many mothers in the Royal Brunei Armed Forces (RBAF) have been trailblazers, breaking into traditionally male-dominated roles such as operations, combat, not to mention, leadership roles. Their presence challenges stereotypes and paves the way for future generations of women. This further underscores the ongoing commitment to fostering diversity and inclusivity within the armed forces and stand as symbols of progress and determination, paving the way for future generations of women in aviation and beyond. As a mother and military pilot, I will continue to strive to balance family responsibilities with my demanding career, all with the intent to take advantage of any opportunities the RBAirF throws my way.

Family photo with the Commander of RBAirF during Wing Presentation at Rajawali Foyer, RBAirF HQ.

APPROACH NON-RADAR & APPROACH SURVEILLANCE RADAR COURSE

by Cpt (U) Faeiqah Nadzirah

Maj (U) Dk Aainaamolyatie and Cpt (U) Faeiqah with their Course Manager for Approach Non-Radar Course.

It was a mixture of feelings prior to our departure to Petaling Jaya, Selangor for a 2-month long back-to-back course called the Approach Non-Radar and Approach Surveillance Radar course conducted by Aviation Academy (AvAC), Clearwisdom Sdn. Bhd., a private Air Traffic Control-Approved Training Organisation. Major (U) Dk Aainaamolyatie and I were also the first batch of officers to be sent for the course as previously we were sent to do our basic air traffic control course in Singapore and Malaysia respectively.

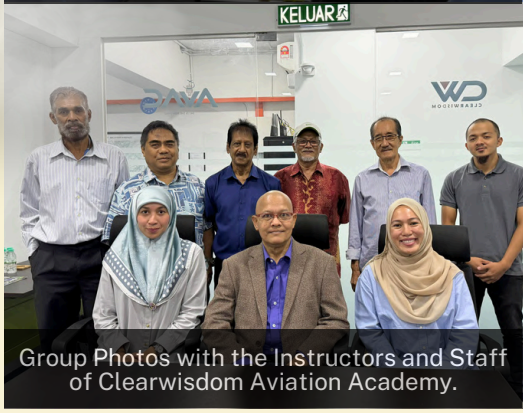
The course was divided into two as mentioned earlier where the first half of the course was Approach Non-Radar course. It differs greatly from what we did during our basic course where it focused mainly on Aerodrome where you have to be visual with not only the ground but most importantly the aircraft in the air. The rule of the thumb for ATC generally is to prevent collision, you just have to ensure everything is safely separated following the procedures following the International Civil Aviation Order (ICAO).

The non-radar course was demanding and fast paced as we had to study and know the airspace by heart prior to starting our simulator. For us as experienced aerodrome controllers, the theory part was similar to what we studied before, so it was a breeze. However, for the practical part, it's true how they say there are bad controlling days, and we also had our days during the simulator exercises due to the packed schedule. Since it was just the two of us in the course, we had to squeeze in 3 simulator exercises per person in a day that at the end of the day we were mentally exhausted.

People might think that doing a course abroad is a paid holiday, but it was the opposite for us as almost every night we had a discussion on what our traffic was like and how to make it better the next time we were in the simulator as a way to improve ourselves. It was somehow nerve-racking as we were not familiar with Malaysian airspace and the apparent difference is literally on its name – 'Non-Radar'.

What helped the most was familiarising with the flight strip movements on the flight strip bay (for non-ATC people this is the bay they use to put all the flight strips in place) as they indicate the presence of aircraft at certain reporting points as well as their respective levels that we have to keep our strip movement to ensure proper and adequate separation has been applied.

Sim Training with the instructor.



Group Photos with the Instructors and Staff of Clearwisdom Aviation Academy.

The second part of the course that we did was the Approach Radar Surveillance course where additionally they introduced studying the radar equipment, the sound-waves and the physics around it on top of having to learn the vectoring techniques during the theory lessons. People would think it is easier because the radar screen is being displayed and you can easily see where the conflict lies. The thing with Radar course is you have to be fast paced that your radio telephony has to include 3 to 4 instructions at one go as all the traffic will converge and meet at some point. At first it was also a struggle differentiating our right and the pilot's right that during the exercises we become the victim of our own mistakes but we definitely learned and progressed greatly from that.

Both courses were conducted in a span of 10 weeks in total which seemed to pass by quickly during our stay. During our course, we had a leisure outing with everyone from the Aviation Academy at Putrajaya Botanical Gardens where we were subdivided into groups and had team-building activities with the instructors and the other course participants under the academy which was a stress reliever and a chance to know everyone better.

We also visited the Kuala Lumpur Air Traffic Control Centre in Sepang looking at a vast space filled with the different islands of control areas ranging from Ground up to Area Control.

We had the privilege to also attend events hosted by the High Commissioner of Brunei Darussalam in Malaysia, His Excellency Brigadier General (Retired) Dato Paduka Haji Mahmud bin Haji Saidin who was also the former commander of the RBAirF, which made us whole and feels close to home moreover with the fasting season at the time.

Overall, it was a remarkable experience to have been and with the skills and insights gained throughout the course to become a credible air traffic controller as well as an Air Force officer to continue contributing to excellence and evolution of the RBAirF.

Clearwisdom Aviation Academy Team Building Outing at Putrajaya Botanical Garden.

Visit to Kuala Lumpur Air Traffic Control Centre (KLATCC) in Sepang, Malaysia.

Tahlil and Berbuka Puasa event at the residence of the High Commissioner of Brunei Darussalam in Malaysia, His Excellency Brigadier General (Retired) Dato Paduka Haji Mahmud bin Haji Saidin.

Group Photo with former Royal Malaysian Air Force officers who are now instructors at the academy.

NAVIGATING NEW HORIZONS: MY JOURNEY THROUGH THE ASEAN MARITIME SECURITY RESEARCH PROGRAM

by Maj (U) Pg Mohd Ady Hafriz

The world of maritime security is an intricate web of geopolitics, strategy, and technology. For those of us in the Royal Brunei Air Force, understanding this domain is not just a professional requirement—it's a strategic imperative. Therefore, when I was nominated to participate in the ASEAN Maritime Security Research Program in Canberra, Australia, I felt extremely fortunate and embraced the opportunity with immense gratitude. This program promised a deep dive into maritime security issues and the chance to build invaluable networks and sharpen my strategic insights. Here's an insider look at what the program entailed and my experiences navigating this enriching journey.

Group Photo with other international participants

What's the ASEAN Maritime Security Research Program All About?

The ASEAN Maritime Security Research Program is a unique initiative designed to foster regional cooperation and enhance maritime security among ASEAN member states and Australia. The program invites naval and air force officers from ASEAN countries to undertake a three-month research stint on maritime security issues pertinent to the Indo-Pacific region. Depending on their service and research focus, participants are placed at the Royal Australian Navy's Sea Power Centre or the Royal Australian Air Force's Air and Space Power Centre.

The 2024 Autumn tranche, which I attended, ran from March 4 to May 31, with a one-week orientation program held from February 26 to March 1. Each tranche hosts up to six scholars, ensuring a focused and collaborative environment. The ultimate goal is for participants to produce a comprehensive research paper and deliver presentations that encapsulate their findings and strategic recommendations.

Diving into the Program: My Experience

From the moment I landed in Melbourne, the journey was a whirlwind of learning, networking, and personal growth. The initial orientation program at the Defence International Training Centre in RAAF Williams, Laverton, was instrumental in acquainting us with Australia and the Australian military environment, setting a solid foundation for understanding the regional security landscape and the program's expectations.

As the research program commenced in Canberra, the Air and Space Power Centre became the hub of our daily activities. The program's structure, a blend of rigorous academic briefings, hands-on practical exercises, and high-level strategic discussions, was designed to deepen our understanding of maritime security. This immersive environment allowed me to engage fully with the material and fellow participants, fostering a collaborative atmosphere conducive to learning and professional growth.

Maj (U) Ady Hafriz shared his research paper


Group photo during the last day of the program

My research focused on the ASEAN Direct Communication Infrastructure (ADI) and its role in maritime crisis management. The ADI is a critical tool for ensuring rapid, secure communication between defence ministers, thereby improving real-time coordination and reducing the risk of escalation during crises. My paper explores how the ADI enhances decision-making efficiency, facilitates timely information sharing, and strengthens regional cooperation in managing maritime crises. Additionally, it examines case studies where the ADI has been effectively utilised and identifies areas for further improvement to maximise its strategic value.

The program's schedule was packed yet thoughtfully designed. Weeks were punctuated by visits to key installations like the Australian Maritime Safety Authority and the Maritime Border Command. These experiences provided a holistic understanding of maritime security operations, the strategic use of technology, and inter-agency cooperation.

In addition to the intensive research activities, our cohort had the privilege of participating in the ASEAN-Australia Special Summit Maritime Cooperation Track Forum and Table-Top Exercise. This forum was a pivotal event that brought together key maritime security stakeholders from ASEAN and Australia, facilitating high-level discussions and practical exercises to enhance regional maritime cooperation. These activities provided more profound insights into collaborative maritime security efforts and allowed us to apply our research in a real-world context, testing our strategies and recommendations. Significant events like the Air and Space Power Conference also offered further opportunities to engage with experts and policymakers, broadening our perspectives on collaborative defence innovation and technological advancements.

A highlight of the program was the series of presentations we delivered. My final presentation, which summarised my findings on the ADI, was particularly well-received. The feedback highlighted the thoroughness of my research and its practical implications for enhancing maritime crisis management among ASEAN member states.

Key Takeaways and Reflections

Reflecting on my time in the program, several key takeaways stand out. First, the importance of regional cooperation cannot be overstated. The program reinforced how crucial it is for ASEAN member states to work together to address shared maritime security challenges. Second, advanced communication technologies, like the ADI, are pivotal in crisis management and operational coordination.

Moreover, the hands-on experiences and site visits offered invaluable insights into best practices for integrated maritime security operations. These practical learnings and strategic discussions at forums and conferences have significantly broadened my perspective and enriched my professional toolkit.

In conclusion, the ASEAN Maritime Security Research Program was a profoundly enriching experience. It provided a well-rounded understanding of maritime security issues, fostered invaluable networks, and enhanced my research and professional capabilities. For anyone in the defence sector looking to deepen their knowledge and make meaningful contributions to regional security, this program is an opportunity not to be missed.

RAF CRANWELL EXPERIENCE

by Lt (U) Hariz

I have never ever thought in my life that I would be doing my officer training abroad. Throughout my 7 months in Officer Cadet School (OCS) Brunei, I had always pushed myself to do the best of my ability. Being chosen to represent Brunei in the Modular Initial Officer Training (MIOT) course at Royal Air Force (RAF) Cranwell was an honour and a privilege. This prestigious institution has a distinguished history of producing leaders of Royal Brunei Air Force (RBAirF) and RAF.

Knowing that I will be marching on the same halls and facing the same challenges as many distinguished officers before me was both humbling and inspiring. I was eager to embrace the rigorous training, to learn from the best, and to grow alongside talented cadets from around the world. This experience was not just a significant step in my military career but also a chance to uphold and contribute to the legacy of excellence that RAF Cranwell is renowned for.

Photo with Nigerian Cadet during the Adventure Leadership Test in Grantown-on-Spey in Scotland Mountains.

The cold weather at RAF Cranwell presented a constant challenge throughout the MIOT course. The biting wind, freezing temperatures, and occasional snow made even the simplest tasks more difficult. One of the most demanding experiences was during a week-long the Eagles Edge Exercise conducted in sub-zero temperatures. This exercise required us to apply our survival skills, navigate difficult terrain, and complete mission objectives while battling the elements. We learned to adapt our strategies, conserve our energy, and support each other to overcome the challenges posed by the weather.

Group Photo with International Cadets of MIOT.

This experience was a testament to the power of resilience and adaptability, reinforcing our ability to remain effective while under pressure.

One of the most enriching aspects of the MIOT course was meeting and training alongside cadets from various parts of the world. This diverse environment provided a unique opportunity to learn from different perspectives and cultures. Sharing experiences with international cadets broadened my understanding of global military practices and fostered a sense of global camaraderie. It also helps me enhance my cultural awareness and sensitivity. It was fascinating to hear about their backgrounds, motivations for joining the military, and the challenges they faced. The diversity within the course encouraged a spirit of inclusivity and mutual respect, which is an essential qualities for any officer serving in a global context.

B-Flight Group Photo during Inter-Flight Ultimate Challenge.

The physical training was demanding, requiring peak fitness and endurance. There were moments when exhaustion set in, and pushing through those limits seemed almost impossible. However, these challenges were crucial in building resilience. Overcoming physical and mental fatigue taught me the importance of perseverance and grit.

Photo with Malaysian Cadet during the Case-Evac Challenge.

Another significant challenge was the academic aspect of the training. The coursework was rigorous, covering a wide range of topics essential to be an Royal Air Force (RAF) officer. Balancing the physical demands with academic requirements was a constant struggle. However, completing the Generic Term in OCS and support from fellow cadets was invaluable. Study groups with the UK and international cadets helped me grasp complex concepts and stay motivated. The challenge of balancing physical and academic demands ultimately strengthened my time management and prioritisation skills, which are an essential trait for any successful officer.

Completing the Modular Initial Officer Training (MIOT) course at RAF Cranwell marks a significant milestone in my journey in the Royal Brunei Armed Forces (RBAF). This rigorous training has equipped me with essential leadership skills and knowledge needed to become an officer in the RBAF. It has also demonstrated resilience, adaptability, and a commitment to excellence, preparing me to face the dynamic challenges of today's world. Everyone's contribution is vital in upholding the security of Brunei Darussalam and operational effectiveness of the RBAF. I am grateful for the opportunity to have been a part of such a prestigious training program.

Eagle Edge Exercise using Chinook Helicopter.

Group Photo with the family during Graduation Day.

Graduation Photo of Intake MIOT 26.

FEMALE RBAF PERSONNEL AT THE GRAND PARADE

Workload Hazard

'Multitasking' is the definition of the military personnel, especially for the military officers. However, how much task can a person take at one time, this is where mental capacity comes in. Mental capacity the ability to make an informed decision based on understanding a situation, the options available, and the consequences of the decision. It is important to highlight that not every person has the same mental capacity.

This is where workload hazard comes in as this hazard refers to potential issues or risks associated with the management, distribution, and execution of tasks and responsibilities within a given system, environment, or organisation. This is mostly relevant as military personnel deals with Project Management, Occupational Health and Safety and work with computers a lot on a daily basis.

3 Factors:

1. Project Management

Workload hazards in project management can occur when team members' workloads are not divided fairly, which can cause problems including burnout, lower productivity, and possible project delays.

2. Occupational Health & Safety

In the workplace, overwork or improper management of the workload can result in stress, exhaustion, and health issues for workers, which are examples of workload risks in the workplace.

3. Computing and System

In computing and system, workload hazards might include problems with handling jobs and resources, like conflicts, inefficiencies, or performance bottlenecks that affect system performance as a whole.

While there are benefits to multitasking, it is also linked to anxiety and depressive symptoms. Due to the fact that it can heighten negative feelings, increase irritability or impatience, and even cause chronic stress. This workload hazard is something that I have personally experienced when I was pregnant. I continued to feel as though I was failing at any task that I was given, to the point where I was diagnosed prenatal depression. Again, it is crucial to remember that not everyone possesses the mental capacity to multitask.

MITIGATIONS:

1

Prioritization and Planning

Make detailed plans and rank your to-do list according to priority and urgency. Utilise tools to manage and visualise workloads. Something as basic as a checklist

2

Delegation

Delegate tasks appropriately, considering team members' strengths and capacities. It is okay to ask for help.

3

Regular Reviews

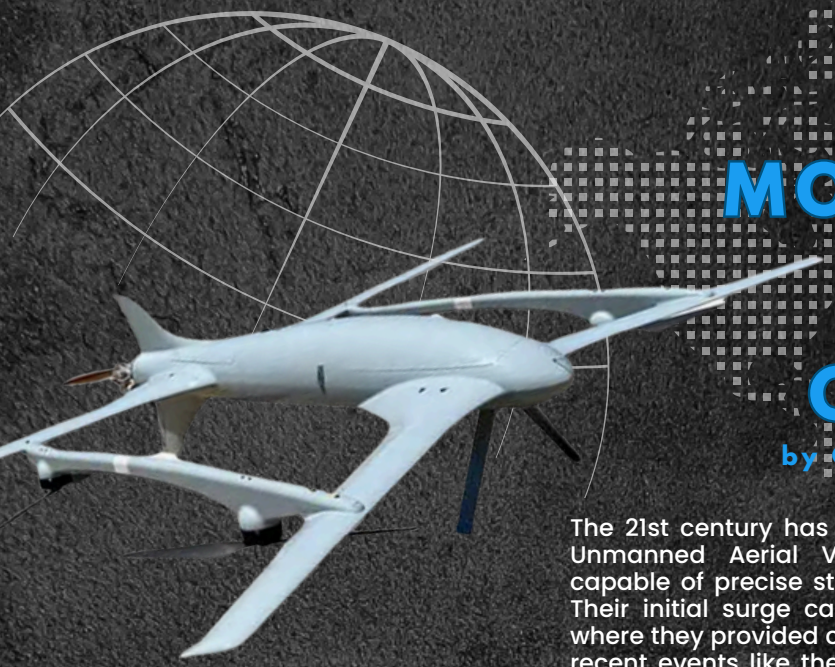
Conduct regular reviews of workloads and processes to identify areas for improvement and make necessary adjustments. Do raise voice your concerns, when you cannot do that particular task and ask for assistance.

Training & Development

Invest in training to better your abilities and increase task execution efficiency. Speak with your senior colleagues who have tons of experience, and take note of their lessons learnt.

4

If you are experiencing negative feelings, increase irritability or impatience don't hesitate to request for counselling session from our own welfare unit, *Sel Kesejahteraan Unit, TUDB*. Addressing and identifying workload hazard is important. Don't wait until unwanted things happen to you.



MORAL DILEMMA IN UAV OPERATIONS

by Cpt (U) Khairul

The 21st century has witnessed a revolution in warfare with the rise of Unmanned Aerial Vehicles (UAVs). These sophisticated weapons, capable of precise strikes, have become prevalent in modern conflicts. Their initial surge came after 9/11, particularly in the "War on Terror," where they provided crucial intel, surveillance, and strike capabilities. The recent events like the 2019 Houthi attack on Saudi oil facilities and the ongoing war in Ukraine highlight their growing role in air power. However, despite their undeniable tactical advantages, the widespread use of UAVs raises ethical concerns that violate traditional war ethics principles.

UAVS AND WAR ETHICS

UAVs have several advantages in specific areas of air power, such as endurance, continuous intelligence gathering, cost effective, low-risk personnel casualty and ability to maneuvers in urban environments. However, the use of UAVs in warfare challenged the concept of Jus in Bello (War Ethics), hence raises moral dilemma in operating it. Jus in Bello focuses on how to conduct the war with morality with the aim to minimise unnecessary suffering and harm towards civilian and combatant alike. Bello is a specific concept within International Humanitarian Law that focuses on two principles: Principle of Proportionality, Principle of Discrimination and principle of Military Necessity.

MORAL DILEMMAS

High Risk of Civilian Casualties: Operating UAVs in densely populated areas significantly increases the risk of civilian casualties. Even with advanced technology, precise strikes can cause collateral damage due to blast radius and target proximity. The high number of civilian casualties reported in recent conflicts like Ukraine and Yemen exemplifies this dilemma. These casualties violate the principle of proportionality, raising questions about the ethical justification for such operations.

False Targets: UAVs rely on intelligence gathering, which can be inaccurate which can lead to targeting errors and attacks on non-combatants. These violates the principle of distinction. Several tragic incidents, such as the 2009 US drone strike on a wedding ceremony in Afghanistan and the 2015 Doctors Without Borders hospital bombing, highlight the potential for devastating consequences from faulty intelligence.

Psychological Effect on UAV Operators: Despite operating remotely, UAV operators are exposed to constant death and destruction on screen, leading to a unique moral burden. Studies show a high prevalence of PTSD among UAV operators, who experience anxiety, grief, and insomnia. This psychological impact not only violates the principle of avoiding unnecessary suffering but also raises concerns about operator well-being and potentially compromised decision-making.

UAVS AND WAR ETHICSSTRATEGIC IMPLICATIONS: BALANCING ETHICS WITH EFFECTIVENESS

UAVs have several advantages in specific areas of air power, such as endurance, continuous intelligence gathering, cost effective, low-risk personnel casualty and ability to maneuvers in urban environments. However, the use of UAVs in warfare challenged the concept of Jus in Bello (War Ethics), hence raises moral dilemma in operating it. Jus in Bello focuses on how to conduct the war with morality with the aim to minimize unnecessary suffering and harm towards civilian and combatant alike. Bello is a specific concept within International Humanitarian Law that focuses on two principles: Principle of Proportionality, Principle of Discrimination and principle of Military Necessity.

CONCLUSION

The rise of UAVs presents a complex ethical challenge. While their technological advancements offer strategic benefits, these must be weighed against the potential for civilian casualties, targeting errors, and psychological strain on operators. Stricter regulations, strong leadership, and prioritising operator well-being can help mitigate these concerns.

ROYAL BRUNEI AIR FORCE - FIT TO FLY AND FIGHT

by Lt Col (U) Colin Would, the RBAirF's Head of Aviation Safety

The Brunei Context

Those personnel based at Rimba Air Force Base who have seen me (and overtaken me!) as I slowly run around the base every Tuesday and Thursday morning know that I am one of many trying to keep at bay the twin risks of cardiovascular diseases and diabetes - the leading causes of death here in Negara Brunei Darussalam. In addition, in this country we have the highest obesity prevalence rate out of all of the ASEAN countries. If allowed, these health issues could combine to reduce our individual and collective resilience, and negatively impact on the RBAirF's Mission - "To deliver air power in defence of Brunei Darussalam and its interest".

INTRODUCTION

Physical fitness plays a pivotal role in aviation, impacting the safety, efficiency, and overall performance of all personnel. This importance is underscored by the stringent physical fitness standards set by the RBAirF, which are designed to ensure that all personnel can perform their duties effectively and safely. In this article I will explore the various aspects of why physical fitness is crucial to aviation safety, covering physiological demands, cognitive performance, emergency preparedness, long-term health, and mandatory requirements.

Flying as pilots, crewmen and loadmasters, involves unique physiological challenges. CN295MW aircrew will be exposed to varying levels of altitude, has a risk of exposure to hypoxia, a condition where the body is deprived of adequate oxygen supply. Physically fit individuals are better able to cope with hypoxia as their cardiovascular systems are more efficient in oxygen transport and utilisation. Additionally, the confined and often ergonomically challenging environment of a the RBAirF's helicopters can lead to musculoskeletal issues. Regular exercise and maintaining good physical fitness can prevent these issues, ensuring that all aircrew operate effectively whilst flying.

PHYSIOLOGICAL DEMANDS

Cognitive performance is critical in aviation, where decision-making, situational awareness, and quick reflexes can mean the difference between a routine flight and a serious incident. Physical fitness has been shown to have a positive impact on cognitive functions. Regular physical activity improves blood flow to the brain, which can enhance memory, attention, and executive functions. Moreover, physically fit individuals often experience better sleep quality, which is crucial for maintaining cognitive performance. Fatigue is a significant risk factor in aviation, and regular exercise can help mitigate its effects, leading to better overall performance and safety.

EMERGENCY PREPAREDNESS

In the rare but critical event of an emergency, physical fitness can be a lifesaver. Aircrew may need to respond rapidly and effectively to emergencies, which can include decompression events, fires, or the need to evacuate an aircraft. Physical strength, endurance, and agility are essential in these situations to manage emergency equipment, assist passengers, and navigate the aircraft under duress. For instance, being able to perform CPR, carry incapacitated individuals, or handle emergency exits requires a certain level of physical fitness that must be maintained through regular training and exercise.

LONG-TERM HEALTH

The aviation profession often involves irregular hours, time zone changes, and prolonged periods of inactivity, all of which can take a toll on an individual's health. Regular physical activity can counteract these effects by promoting cardiovascular health, maintaining a healthy weight, and reducing the risk of chronic diseases such as hypertension, diabetes, and obesity. Long-term health is not only beneficial for the individual's quality of life but also for their professional longevity. Aircrew who maintain good health are more likely to have longer, more productive careers, free from the debilitating conditions that can be exacerbated by the demands of their job.

REGULATORY REQUIREMENTS

The RBAirF imposes strict medical and physical fitness requirements on all of our aircrew, both before they enlist and throughout their careers. These regulations are in place to ensure that all personnel are physically capable of performing their duties without posing a risk to themselves, their fellow crew members, or passengers. Regular medical examinations assess cardiovascular health, vision, hearing, and overall physical condition. Meeting these standards often requires a commitment to maintaining physical fitness through regular exercise, healthy eating, and lifestyle choices.

LONG-TERM HEALTH

Physical fitness is closely linked to psychological well-being, which is crucial in the high-stress environment of aviation. Exercise has been proven to reduce symptoms of anxiety and depression, improve mood, and enhance overall mental health. For aircrew, managing stress effectively is vital, as high stress levels can impair judgment, reduce concentration, and lead to errors. Engaging in regular physical activity provides a healthy outlet for stress and contributes to a more balanced and resilient mental state.

TEAM PERFORMANCE

In the aviation, teamwork is essential. Whether it's the coordinated efforts between pilots and air traffic controllers, or the collaboration among crew members, effective teamwork can significantly impact the safety and efficiency of flight operations. Physical fitness contributes to better teamwork by fostering higher energy levels, reducing workplace absenteeism due to health issues, and improving morale. A physically fit team is more likely to perform cohesively and effectively, particularly under pressure, which enhances overall operational performance.

PSYCHOLOGICAL WELL-BEING

Physical fitness is closely linked to psychological well-being, which is crucial in the high-stress environment of aviation. Exercise has been proven to reduce symptoms of anxiety and depression, improve mood, and enhance overall mental health. For aircrew, managing stress effectively is vital, as high stress levels can impair judgment, reduce concentration, and lead to errors. Engaging in regular physical activity provides a healthy outlet for stress and contributes to a more balanced and resilient mental state.

PRACTICAL STRATEGIES FOR MAINTAINING PHYSICAL FITNESS

Given the importance of physical fitness in aviation, it is essential for aviation professionals to adopt practical strategies to maintain their health. This can include regular cardiovascular and strength training exercises, which help improve endurance and muscle strength. Flexibility exercises, such as yoga or stretching, can prevent musculoskeletal issues and improve overall physical function. Additionally, adopting a balanced diet, staying hydrated, and ensuring adequate rest are critical components of a fitness regimen. For aircrew with irregular schedules (such as when away on courses or holiday), it is important to find ways to integrate exercise into their routines, such as using workplace or hotel gyms, making time to engage in outdoor activities, or incorporating short workouts into their daily schedules. Mandated health check-ups and consultations with medical professionals can also help in monitoring health status and making necessary adjustments to fitness plans.

UNMANNED COMBAT AERIAL VEHICLES

by Lt (U) Nadzirah

THE EVOLUTION AND IMPACT OF UNMANNED COMBAT AERIAL VEHICLES

Unmanned Combat Aerial Vehicles (UCAVs), also known as combat drones, have dramatically transformed modern warfare. These sophisticated machines are remotely piloted or autonomously operated, and they are equipped with weaponry and surveillance equipment. As technology has advanced, UCAVs have become integral components of military strategy, offering capabilities that enhance both combat effectiveness and operational efficiency.

THE GENESIS OF UCAVS

The concept of unmanned aerial vehicles (UAVs) dates back to World War I when the idea of using pilotless aircraft for reconnaissance and combat missions was first explored.

However, it wasn't until the late 20th century that technological advancements made UCAVs a viable reality. The development of sophisticated guidance systems, miniaturized sensors, and reliable communication networks paved the way for modern combat drones.

One of the earliest and most well-known UCAVs is the MQ-1 Predator, introduced in the 1990s. The Predator demonstrated the potential of drones in reconnaissance and strike missions, particularly in regions where manned aircraft operations were risky or impractical. Its successor, the MQ-9 Reaper, further expanded these capabilities with greater endurance, higher payload capacity, and advanced targeting systems.

TECHNOLOGICAL ADVANCEMENTS

Modern UCAVs are marvels of engineering, incorporating cutting-edge technology in various domains. Key advancements include:

1. Autonomy and Artificial Intelligence: While early drones required constant human oversight, contemporary UCAVs can perform many tasks autonomously. AI algorithms enable these drones to process vast amounts of data in real-time, identify targets, and execute complex missions with minimal human intervention.
2. Stealth Technology: To evade enemy radar and anti-aircraft systems, many UCAVs incorporate stealth technology. This includes radar-absorbing materials, low observable designs, and advanced electronic countermeasures.
3. Sensor Suites: UCAVs are equipped with an array of sensors, including high-resolution cameras, infrared imaging systems, synthetic aperture radar, and electronic surveillance tools. These sensors provide comprehensive situational awareness and target acquisition capabilities.
4. Communication Systems: Secure and robust communication links are crucial for the operation of UCAVs. Advances in satellite communication and data encryption ensure that drones can be controlled over vast distances and relay real-time intelligence to command centers.

OPERATIONAL BENEFITS

The integration of UCAVs into military operations offers several significant advantages:

1. Risk Reduction: UCAVs reduce the risk to human pilots by taking on dangerous missions in hostile environments. This is particularly valuable in reconnaissance, surveillance, and high-risk strike missions.
2. Cost-Effectiveness: Drones are often more cost-effective than manned aircraft. They have lower production and maintenance costs, and their ability to loiter for extended periods reduces the need for frequent sorties.
3. Precision and Efficiency: Equipped with advanced targeting systems, UCAVs can deliver precision strikes with minimal collateral damage. Their ability to gather and relay real-time intelligence enhances decision-making and mission planning.
4. Operational Flexibility: UCAVs can be deployed in a variety of roles, including surveillance, close air support, and strategic strikes. Their versatility makes them invaluable assets in both conventional and asymmetric warfare.

ETHICAL AND STRATEGIC CONSIDERATIONS

The rise of UCAVs has sparked ethical and strategic debates. One major concern is the potential for increased civilian casualties due to the reliance on remote operators and automated systems. Ensuring accountability and adherence to international laws of war is paramount to addressing these concerns.
Additionally, the proliferation of UCAV technology raises strategic issues. As more nations and non-state actors acquire combat drones, the risk of their misuse in conflicts and terrorist activities increases. This necessitates robust international regulations and countermeasures to prevent the unauthorised use of UCAVs.

THE FUTURE OF UCAVS

The future of UCAVs is poised to witness even more sophisticated developments. Emerging technologies like swarm intelligence, where multiple drones operate collaboratively, and advancements in AI and machine learning, promise to further enhance the capabilities of combat drones. Furthermore, the integration of UCAVs with other military assets, such as manned aircraft and ground forces, will create more cohesive and effective combat systems.

In conclusion, Unmanned Combat Aerial Vehicles have revolutionised modern warfare by providing unparalleled capabilities in reconnaissance, surveillance, and precision strikes. While they offer significant operational advantages, addressing ethical and strategic concerns is crucial for their responsible use. As technology continues to evolve, UCAVs will undoubtedly play an increasingly vital role in the future of military operations.

SUSTAINABLE AVIATION FUEL

by Lt (U) Nadzirah

Aviation has become a cornerstone of modern society, enabling global connectivity and economic growth. However, this progress comes at a significant environmental cost, as traditional jet fuels contribute substantially to greenhouse gas emissions. In response to the growing urgency of climate change, the aviation industry is increasingly turning its attention to sustainable aviation fuel (SAF) as a pivotal solution to reduce its environmental impact.

UNDERSTANDING SUSTAINABLE AVIATION FUEL

Sustainable aviation fuel, commonly referred to as SAF, is a type of biofuel specifically designed to power aircraft. Unlike conventional jet fuel derived from crude oil, SAF is produced from renewable sources such as biomass, waste oils, agricultural residues, and even captured CO2. The use of SAF has the potential to significantly reduce the carbon footprint of air travel, as it can lower lifecycle greenhouse gas emissions by up to 80% compared to traditional fossil-based jet fuels.

TYPES OF SUSTAINABLE AVIATION FUEL

There are several pathways to producing SAF, each with distinct feedstocks and production processes. The most common types include:

1. Hydroprocessed Esters and Fatty Acids (HEFA): This is the most widely used SAF today, produced from waste fats, oils, and greases. HEFA fuels are chemically similar to traditional jet fuel, making them compatible with existing aircraft engines and fuelling infrastructure.

2. Fischer-Tropsch Synthetic Paraffinic Kerosene (FT-SPK): Produced through the gasification of biomass followed by the Fischer-Tropsch process, FT-SPK can be derived from various feedstocks, including municipal solid waste and agricultural residues. This pathway offers significant potential for large-scale production.

3. Alcohol-to-Jet (ATJ): This method converts alcohols, such as ethanol and butanol, into jet fuel through a series of chemical reactions. ATJ fuels can be made from a variety of renewable sources, including sugarcane, corn, and lignocellulosic biomass.

4. Power-to-Liquid (PtL): A more recent development, PtL involves using renewable electricity to produce hydrogen, which is then combined with captured CO2 to create synthetic jet fuel. This process has the advantage of potentially being carbon-neutral, depending on the source of electricity.

ENVIRONMENTAL BENEFITS AND CHALLENGES

The primary advantage of SAF is its potential to drastically reduce greenhouse gas emissions from aviation. By utilising renewable feedstocks and advanced production technologies, SAF can achieve significant carbon savings throughout its lifecycle. Additionally, SAF can reduce other harmful emissions, such as sulphur oxides and particulate matter, which contribute to air quality issues around airports.

However, there are challenges to widespread SAF adoption. The production of SAF is currently more expensive than traditional jet fuel, largely due to the cost of feedstocks and the complexity of production processes. Scaling up SAF production to meet the growing demand from the aviation industry will require substantial investment in research, infrastructure, and technology.

REGULATORY AND INDUSTRY SUPPORT

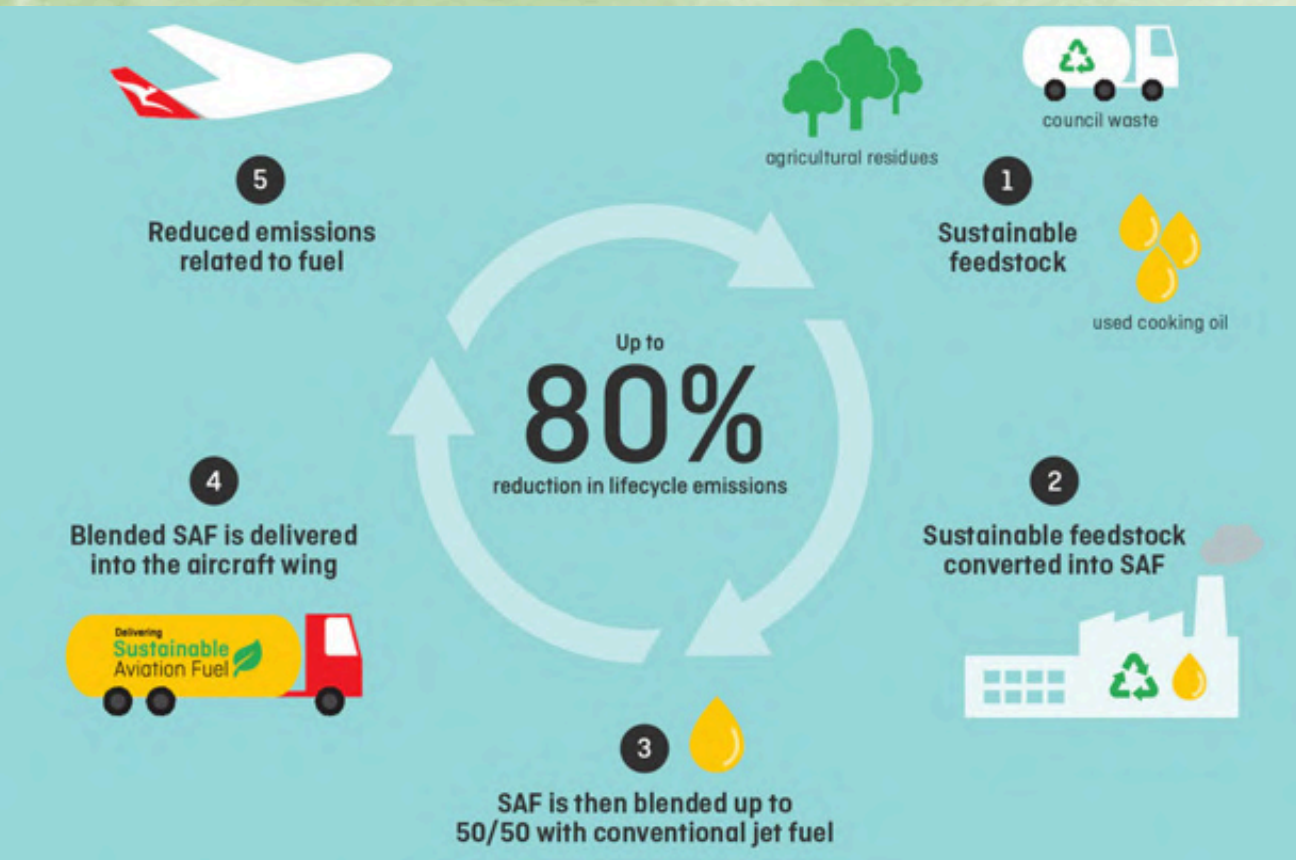
Recognizing the importance of SAF in achieving climate goals, governments and industry stakeholders are taking steps to support its development and adoption. The International Civil Aviation Organization (ICAO) has established the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which incentivizes airlines to reduce their carbon emissions through the use of SAF and other measures.

In addition, several countries have implemented policies to promote SAF production and usage. For example, the European Union has introduced the Renewable Energy Directive, which includes targets for SAF in aviation. In the United States, the Federal Aviation Administration (FAA) and the Department of Energy (DOE) are collaborating on research and development initiatives to advance SAF technologies.

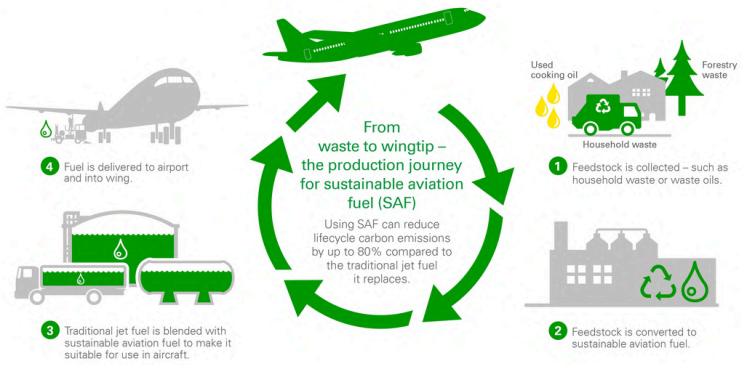
THE ROAD AHEAD

As the aviation industry strives to meet ambitious climate targets, the adoption of sustainable aviation fuel will play a crucial role in reducing its environmental impact. Continued investment in research, production infrastructure, and supportive policies will be essential to overcoming the challenges associated with SAF.

In conclusion, sustainable aviation fuel represents a promising solution to the environmental challenges posed by aviation. By embracing SAF, the aviation industry can take a significant step toward a greener, more sustainable future, ensuring that the benefits of air travel are enjoyed by future generations without compromising the health of our planet.



How is sustainable aviation fuel made?



THE RISE OF VIRTUAL CYCLING

by Lt (U) Nabil

A NEW ERA IN FITNESS

Virtual cycling, a rapidly growing trend in the fitness world, has transformed how people engage with indoor cycling. This innovation combines traditional cycling with advanced technology, offering an immersive experience that brings the outdoors inside. Virtual cycling has redefined the fitness landscape, making it more accessible, interactive, and enjoyable for people of all fitness levels.

WHAT IS VIRTUAL CYCLING?

Virtual cycling involves using stationary bikes equipped with sensors and connected to digital platforms. These platforms simulate outdoor cycling experiences by displaying virtual environments on screens, ranging from scenic countryside routes to urban landscapes. Riders can join live or pre-recorded classes, compete against others, or embark on solo rides through various terrains.

The technology behind virtual cycling includes smart trainers, which adjust resistance based on the virtual terrain, and apps like Zwift, Peloton, and Rouvy. These apps provide a plethora of routes, training programs, and social features, enhancing the overall experience. Users can track their performance metrics, such as speed, distance, cadence, and power output, to monitor progress and set new goals.

THE APPEAL OF VIRTUAL CYCLING

1. Accessibility and Convenience

One of the primary attractions of virtual cycling is its convenience. Unlike traditional outdoor cycling, which can be hindered by weather conditions, traffic, or geographical limitations, virtual cycling can be done anytime and anywhere. This flexibility is particularly appealing to those with busy schedules or who live in areas unsuitable for cycling.

2. Motivation and Engagement

Virtual cycling platforms are designed to keep users engaged and motivated. Interactive features, such as real-time leaderboards, virtual rewards, and social connectivity, create a competitive yet supportive environment. Riders can join group rides, participate in challenges, or compete in virtual races, adding a social dimension that enhances motivation and accountability.

3. Customizable Workouts

Virtual cycling offers tailored workouts to suit individual fitness levels and goals. Whether aiming for weight loss, endurance building, or performance improvement, users can choose from various training plans and programs. These structured workouts, guided by professional instructors or automated programs, ensure that riders get the most out of their sessions.

4. Entertainment and Variety

The immersive nature of virtual cycling makes workouts more enjoyable. High-definition graphics, virtual landscapes, and cinematic experiences transform a monotonous workout into an exciting adventure. Riders can cycle through iconic locations worldwide, from the streets of Paris to the mountains of the Swiss Alps, all from the comfort of their homes.
Health Benefits of Virtual Cycling

5. Cardiovascular Fitness

Regular virtual cycling sessions significantly improve cardiovascular health. The continuous pedaling action strengthens the heart, improves blood circulation, and boosts lung capacity. Over time, this leads to lower blood pressure, reduced risk of heart disease, and improved overall cardiovascular fitness.

TYPICAL VIRTUAL CYCLING SETUP

Cycling Trainer

Bicycle

Television/Screen

Cycling Software

4. Weight Management

Virtual cycling is an effective way to burn calories and manage weight. Depending on the intensity and duration of the workout, riders can burn hundreds of calories per session. This, combined with a balanced diet, can lead to significant weight loss and improved body composition.

5. Mental Health

Exercise is well-known for its positive effects on mental health, and virtual cycling is no exception. The endorphin release during a cycling session reduces stress, anxiety, and depression. Additionally, the immersive and engaging nature of virtual cycling provides a mental escape, offering a break from daily stresses and enhancing overall well-being.

6. Low-Impact Exercise

Cycling is a low-impact exercise, making it suitable for people of all ages and fitness levels, including those with joint issues or injuries. Virtual cycling allows users to control the intensity and resistance, ensuring a safe and effective workout without putting excessive strain on the body.

THE FUTURE OF VIRTUAL CYCLING

The future of virtual cycling looks promising, with continuous advancements in technology enhancing the experience. Innovations such as virtual reality (VR) integration, augmented reality (AR) features, and more sophisticated smart trainers are expected to make virtual cycling even more immersive and realistic.

As fitness enthusiasts increasingly seek engaging and convenient workout options, virtual cycling will continue to grow in popularity. Its ability to combine physical fitness with technological innovation offers a unique and enjoyable way to stay active and healthy. Whether for seasoned cyclists or beginners, virtual cycling provides an accessible, motivating, and versatile fitness solution that is here to stay.

RBAirF 58TH ANNIVERSARY CELEBRATION

KERIS TERBANG