

FOCUS



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Foreword

From Head Air Force Inspectorate



2020 has been a year when the entire world is turned upside down by the COVID-19 pandemic. As we seek to gradually move ahead into a safer COVID-free world, it is important that the RSAF ensures that our new systems continue to be safely operationalised and seamlessly integrated with our daily operations

In this issue of **FOCUS**, we have CPT Ng from 112 SQN sharing about the journey of operationalising the newly acquired A330 MRTTs. He shares the challenges that the squadron had met and had to overcome along the way while transitioning from the KC-135R.

ME4 Lai from 808 SQN then discusses the logistical perspective of the induction process of the A330 MRTT. He talks about the training of the Air Force Engineers, and ensuring his squadron builds their technical expertise on the aircraft. He also talks about the role of the safety culture in his squadron and how it helped them safely operationalise the A330 MRTT.

CPT Leow from 143 SQN then shares the respectable feat of his squadron achieving 30 years of accident-free flying, through the squadron's strong beliefs in its safety culture and emphasis on the importance of Crew Resource Management and Open Communication.

Finally, CPT Wong from 163 SQN tells us about the dangers of operating the Aster 30 system and the many safety measures that the unit has put in place to ensure its safe operations. As the Fire Unit Commander, he also shares with us his personal experience operating the new Aster 30 system and challenges he faced ensuring the safety of all personnel.

With 2020 fast coming to a close, I urge everyone to continue to do their tasks safely one task at a time, one day at a time. Only then can we make the RSAF a safer work place for everyone. I wish everyone a safe and accomplished end to the year.

Mission Success, Safety Always!

COL Linus Tan Jin Kiat
Head Air Force Inspectorate



Fuelling the FOC Journey



CPT Ng Zi Hao
Pilot
112 SQN

Introduction

In Feb 2014, the RSAF announced the procurement of six A330 Multi-Role Tanker Transport (MRTT) aircraft to replace its fleet of four KC-135R Stratotanker aircraft. On 14 Aug 2018, the RSAF welcomed the arrival of its first A330 MRTT into Changi Air Base, signifying the start of 112 SQN's journey to operationalise the A330 MRTT.

Safety Challenges Along the Journey

Managing the Tempo and Demands

The first batch of aircrew to complete the training with Airbus Defence and Science (DS) consisted of four pilots and three Air

Refueling Operators (ARO). Upon arrival back to Singapore, they started laying the foundations to operationalise the A330 MRTT. There was a lot of work that needed to be done, including development of doctrines, conducting Air-to-Air Refuelling (AAR) trials, and establishment of training paradigms.

Moreover, being the new state of the art procurement, there were multiple demands that were placed on 112 SQN and the A330 MRTT as we operationalised the aircraft. In the first year alone, the SQN hosted an average of one visit per month and conducted several VIP ferries. The SQN also prepared, rehearsed and participated in the RSAF50 parade flypast on 1 Sep 2018 and the NDP flypast in 2019, drawing in much excitement and wows from the crowd.



To tackle the numerous demands placed on the limited manpower, emphasis was placed from the start on the careful management of the operational tempo and the distribution of workload. There was deliberate planning made to adjust the flying tempo during the conduct of key activities and events. Personnel still undergoing their conversion training in Spain were also employed to share some of the workload in terms of doctrine development and hosting of visits.

Unknowns of the AAR System

One of the early challenges the SQN had to overcome was ensuring that the current batch of KC-135R pilots and AROs were able to transition to the new A330 MRTT aircraft operations smoothly and safely. This was especially tricky for the AROs as previously in the KC-135R, they were operating the AAR system from the back of the aircraft and were able to physically view the receiver aircraft. On the A330 MRTT, the AROs are now in the refuelling suite located within the cockpit and don 3D glasses which provided a live video feed of the rear of the aircraft for them to have a full appreciation picture

to operate the AAR system. This adds complexity to the AROs as they would now have to factor in time lag in the video when they operate the AAR system. Thus, the AROs had to undergo numerous training sessions to ensure that every one of them would be familiar with operating the new AAR system.

Though the commercial A330 aircraft has been in operation for over two decades, the military variant has only been in operation for a few years. The AAR system is relatively new and there are rough edges that need to be smoothened. Occasionally, we would discover issues with the system that is not covered in the technical manuals provided. Some of these technical failures raised concerns of safety implications to operations. The SQN maintained close consultation with Airbus DS to seek their technical expertise in such situations. Concurrently, the SQN would also work with Fighter Group and Air Warfare Centre to enhance existing AAR procedures to mitigate any technical limitations or shortfalls. Only after the necessary mitigating measures have been put in place and the operational risks evaluated, would AAR training be allowed to carry on.



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On a separate front, 112 SQN also explored the option to establish links with other A330 MRTT operators for cross-sharing on the operators' level. To date, the SQN has established links with the Royal Australian Air Force, and is looking to extend that working relationship with the French Air Force. These ties have been fruitful and allow us to learn from the experiences of other operators and to incorporate their relevant best practices into our procedures.

Passenger Management

A big improvement of the A330 MRTT from the KC-135R is its ability to carry significantly higher passenger and cargo payload. Being able to carry up to 266 passengers, this is more than four times the capacity any other RSAF aircraft can carry. With this new capability came the challenge of managing this large number of passengers. The first challenge

of passengers. In such cases, the AROs will need to conduct AAR operations inflight while doubling up as cabin attendants. Fatigue will start to be a concern, especially in long haul deployment flights. This was something the squadron faced when we had to deploy to Ex FORGING SABRE, where the A330 MRTT had to conduct three hops to reach mainland USA, with each hop taking an average of 6 to 7 hours. To manage fatigue levels, a detailed crew rotation plan was drafted for the AROs. Dedicated tanking AROs were identified for the different legs of the deployment, and they were relieved of their cabin attendant duties so they could rest between AAR points.

COVID-19

Entering year 2020, 112 SQN was eager to showcase the A330 MRTT's capabilities through the participation of overseas exercises like Ex COPE TIGER and Ex PITCH BLACK. However, the

is the manning of the aircraft doors during airlift missions. Given that the A330 MRTT has eight exit slide doors that need to be manned, this was a big manpower burden for a SQN that only has eleven AROs. As such, the SQN utilised 112 SQN pilots and logistic counterparts from 808 SQN who have been trained in the aircraft egress drills to augment the AROs in this task. For airlift flights where the passenger loads are not full, the passengers will be assigned to specific cabin areas to reduce the requirements to man up all the exit slide doors.

During passenger carrying airlift flights, the AROs will serve as cabin attendants to manage the passengers. The challenge arises when the A330 MRTT is utilised to conduct deployment AAR missions while carrying a large number

of passengers. In such cases, the AROs will need to conduct AAR operations inflight while doubling up as cabin attendants. Fatigue will start to be a concern, especially in long haul deployment flights. This was something the squadron faced when we had to deploy to Ex FORGING SABRE, where the A330 MRTT had to conduct three hops to reach mainland USA, with each hop taking an average of 6 to 7 hours. To manage fatigue levels, a detailed crew rotation plan was drafted for the AROs. Dedicated tanking AROs were identified for the different legs of the deployment, and they were relieved of their cabin attendant duties so they could rest between AAR points.

outbreak of the COVID-19 pandemic placed the world close to a global lockdown. Overseas exercises were either cancelled or postponed, and the RSAF entered into cohorting to ensure operational readiness was not compromised. For 112 SQN, this translated to the reduction in opportunity to test our capabilities beyond Type level competencies. Furthermore, pilot simulator trainings that was conducted overseas came to a halt. 112 SQN responded to make the most of the situation. Crew that were placed on pre-isolation stay home notice were tasked with the generation of system quizzes and briefs.



Dedicated work from home days were utilised to hold system and operational discussions. The SQN also capitalised on this period of the reduced RSAF flying tempo to conduct our internal tanker to tanker AAR training. The focus was on the consolidation of our fundamentals, so we would be better equipped to take on more complex task-level missions when the opportunity arises.

Conclusion

Two years have passed since the arrival of the first aircraft, and the A330 MRTT is almost at the completion of our Full Operational Capability (FOC) journey. Looking back, it has been an eventful journey. There were many uncertainties and lessons learned along the way. Regardless of the challenge ahead, we are focused on the task at hand every day, and aim to do it safely, one day at a time. We forged a culture of lesson sharing and questioning, which has allowed the entire SQN community to grow together through our combined experiences. Moreover, the



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journey does not end after we have obtained FOC. We would have to look ahead into the future and focus on creating a sustainable environment for future generations of A330 MRTT operators. On top of a structured training syllabus, there is a need for proper knowledge management and positive culture of sharing and learning. We look forward to the next generation of A330 MRTT aircrew that will always be Determined to Deliver safely.



Safe Operationalisation of the A330 MRTT: A Logistics Perspective



ME4 Lai Hong Seng
Air Force Engineer
808 SQN

Introduction

When the RSAF inducted our largest aircraft in the form of the Airbus A330 Multi Role Tanker Transport (A330 MRTT) in Aug 2018, we brought a versatile air asset capable of performing Air-to-Air Refuelling, airlift and aeromedical evacuation missions into the SAF.

While it is not new to the RSAF when it comes to acquiring new platforms to replace retiring assets, it was not without challenges as the A330 MRTT gradually took over the ageing KC-135R aerial tankers in the orbat. From the logistical perspective, this article stresses on the fundamentals of our Air Force Engineers (AFEs) leading to the safe operationalisation of the A330 MRTT.

Induction of the A330 MRTT



The A330 MRTT aircraft acceptance was conducted over three weeks at the Airbus Defence and Space (ADS) production facility in Getafe, Spain. The logistics acceptance team, comprising RSAF A330 MRTT trained AFEs, and DSTA Programme Management Team (PMT), would work with the aircraft manufacturers on three key areas, namely (1) Visual inspection of the aircraft, (2) Aircraft system functional checks and (3) Aircraft documentation checks. The scope and proceedings of each of the checks were systematically governed by a series of checklists that were developed by the manufacturers with inputs from the logistics acceptance team and Air Engineering & Logistics Department (AELD). These inputs were primarily based on the lessons learnt from past aircraft acceptance experiences such as the F-15SG, F-16D+ and G550-AEW aircraft.



The acceptance checks were then distributed among the members of the logistics acceptance team, with each member having a clear demarcation of their respective roles and responsibilities. For physical discrepancies or detectable functional failures that were observed during the acceptance, it would be acted on in accordance with an established defect reporting and evaluation process. The logistics acceptance team would highlight the defect to ADS for rectification and report to the DSTA-PMT for proper documentation. Depending on the defect, the logistics acceptance team would evaluate the proposed recovery action by ADS and consult AELD for engineering assessments as required. Defects that could not be recovered prior to the end of the acceptance period would be duly documented in a legally binding Letter of Commitment to the RSAF. As for the third key area on documentation checks, the logistics acceptance team also reviewed all the aircraft documents such as the maintenance records and logbooks to ensure that proper documentation discipline was adhered to. These details would be essential for subsequent maintenance planning, reliability management and engineering assessment as we operationalise the platform and transit from induction to the Operations and Support phase.

Integrated Workforce

It is widely recognised that the key building blocks to safe and reliable flying operations are strong competencies and good maintenance. The RSAF assessed that it should leverage on the expertise of the local aviation commercial entities in the maintenance of A330 MRTT baseline systems, while military-unique areas would be anchored by the RSAF. The birth of the Integrated Workforce (IWF) and its maintenance concept is fundamentally founded on system-based ownership between the two entities in RSAF and Singapore Technology Engineering Aerospace Aircraft Maintenance (STEAM).

Technical expertise aside, STEAM also had prior experience working with the RSAF, and thus were familiar with RSAF's expectations and operating concepts. As such, introducing the STEAM crew to the RSAF's Safety Culture and Safety Management System was faster, as the A330 MRTT's unique IWF began to take shape in the 3rd quarter of Work Year 18/19.

Most notably, it is in the areas of risk assessment that IWF alignments to the RSAF framework are crucial. The joint development of A330 MRTT Common Hazard Identification and Risk Assessment (HIRA) was a telling example

that IWF can benefit with shared beliefs and check-and-balance. It was through this exercise that the IWF benefitted from the cross-sharing of best practices and formulated better ways of doing work safely. The ground up development of the HIRA also brought about individual ownership, sense of involvement in the decision-making process and strong beliefs in safety, which were observed to be better understood on the ground.

Technical and Expertise Build-Up

The RSAF invested in the technical training of the AFEs to equip them with the skills and knowledge to safely maintain the aircraft. Such training is necessary for the AFEs to have a deeper understanding of the system as they embark on performing the maintenance tasks.

Despite the provision of necessary training to accord our AFEs with the necessary qualification, it was recognised that the best way to speed up the RSAF's capability to maintain the critical mission system is through the complement of technical specialists during the initial two years of operations. These technical specialists from ADS were fundamental to the hands-on training, engineering analysis and technical and liaison support over the past one year. This was most evident in our first 4.5 monthly servicing in Oct 2018, a short two months after aircraft delivery. With no prior experience, the preparation for the servicing was filled with several challenges. Fortunately, the technical specialists were able to clarify the task description and procedures, worked with us to optimise the task planning and manpower allocation, and lead the material acquisition in preparation for the servicing. The entire process from the preparation phase to carrying out the servicing to defect troubleshooting and rectification was akin to a baptism of fire, and provided us with an invaluable learning experience.



First Overseas Exercise – EX FORGING SABRE 19

Having operated for slightly over a year since the A330 MRTT was first inducted, the A330 MRTT participated in its first major overseas exercise – EX FORGING SABRE 19 – based off Boise, Idaho. In addition to supporting air-to-air refuelling operations in-theatre, the A330 MRTT also ferried over 130 personnel, personal effects and detachment cargo over a flight time of 20 hours, from Singapore to the US.

Due to the limited operational experience, the IWF overcame uncertainties by developing scenario-based planning and emphasis was placed on coordination work with Boise Airport during the various planning conferences with them. The exercise team subsequently worked through the operational requirements, put forth the safety considerations and developed the Task Safety Analysis.

As the first major overseas exercise coupled with the absence of technical specialists and support services from ADS in-theatre, the A330 MRTT IWF prioritised qualified senior personnel with detachment experience during the team selection. In addition to the good preparation work for XF5'19, we successfully supported the achievement of all logistics objectives for the A330 MRTT in the SAF integrated sense and strike operations.



The Development of Unit Safety Culture



Figure 1: DuPont's Safety Culture Model¹

Despite overcoming the early challenges of operationalising the A330 MRTT platform, it is critical to ensure that management continues to give appropriate priority to shape and sustain safety and accident prevention efforts. It is of equal importance that this attitude to be shared across all levels of management and the entire IWF. The active participation of STEAAM management during 5 Air Engineering & Logistics Group (AELG) Commander's Call, SAF-wide Safety Review and Safety Timeout allows the exchange of perspectives and opinions on safety related occurrences. The keen interest between STEAAM and the RSAF towards safety issues exemplified the commitment of IWF in building a shared culture, which is believed to be fundamental to the achievement of Safety Excellence as depicted by the DuPont's Safety Culture Model (see Figure 1).

¹. Behaviour based intervention for occupational safety – case study. (2015). Elsevier B. V., 4876–4883.

A positive attitude to safety, however, is not in itself sufficient to create a safety culture. Top management within the unit needs to give leadership and command emphasis, walk the ground and build the safety culture step by step - Building a Safety Culture is a journey. A step in the right direction was evident when RSAF leadership was invited to STEA Safety Seminar, where it gives the RSAF an appreciation of ST perspectives towards safety, their beliefs and most importantly an assessment of the alignment in values. On a daily basis, the RSAF and STEAM also forged professional ties during daily 5 AELG Principal Staff Group (PSG) meetings when quality and safety matters are discussed to strengthen MRTT position in supporting the RSAF missions. Typically, organisations find safety culture a critical factor that sets the tone for implementation of safety within their workplaces. An organisation that develops and maintains a well-built safety culture becomes more effective at preventing accidents. In addition, management's interest and involvement towards accident prevention, and behaviour-based interventions reflect the real

commitment to safety at all levels within the unit. Since the implementation of forms.sg to digitise Behavioural-Based Safety submissions at the 5 AELG level, the initiative has also extended to the IWF and its management.

The Safety Vision and Beliefs of the IWF can also be characterised by means of the DuPont Bradley Curve (see Figure 2), where the desirable traits of the workforce, forms the backbone for Operational Excellence. When applying the DuPont Bradley Curve, it is important to understand the transition of a group that relies on natural instincts of individuals to govern safety, to a desirable state where collective wisdom and genuine Crew Resource Management (CRM) comes natural in teams.

In the reactive category, there is absence of focus on safety, management is rarely involved, with responsibility on Safety resting on a Safety Manager. Units at this stage are typically reactive, rather than proactive to problems. Moving toward the Dependent category, a slight increase in management commitment

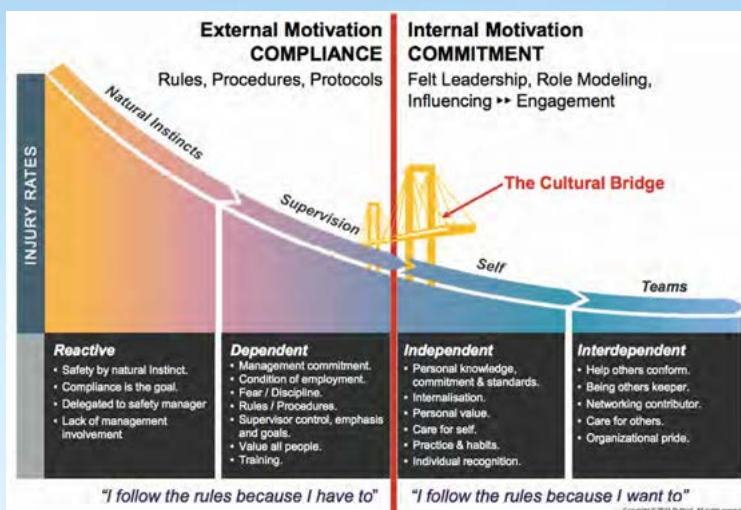


Figure 2: DuPont Bradley Curve²

² Safety excellence lead to Operational Excellence & Sustainable Growth. (2016). DuPont Sustainable Solutions.

is present, Safety consideration begins to take effect, with a focus on rules and procedures, albeit under the influence of much needed Supervision. Unit at this stage is seen providing safety training for its people.

In order to get past the hurdle of supervision-enforced safety culture, a cultural shift from an extrinsic to an intrinsic motivation is necessary. In the self-dependent category, personal knowledge and commitment to standards is stressed. Safety management is internalised within the unit and focus is on personal values as the safety foundation. Safety recognition within the unit is also evident to encourage improvements and reinforce positive behaviours.

Finally, in the interdependent category, the unit is seen working in teams and is selfless to help others conform to safety. This is done out of genuine care for each other and the unit at this stage has great organisational pride. That is when we see great CRM, effective supervision and assertiveness to correct one another without rank gradient nor favour.

808 SQN's presence as a permanent member in 112 SQN's monthly safety meeting holds significant meaning to the entire A330 MRTT community. It brings the IWF and operators together, in a conducive setting to reflect upon safety matters concerning logistics and operations, such that informed decisions affecting all parties can be made.

Conclusion

In order to bring the A330 MRTT IWF safety culture to desired maturity, it is therefore important to know the ingredients necessary to work towards both Safety and Operational Excellence. To ***Mission Success*** and ***Safety Always!***



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30 Years of Safe Flying



CPT Leow Yee Shiang
Pilot
143 SQN



In 2020, 143 SQN "Phoenix" achieved 30 years of accident-free flying with over 40,000 flying hours completed. This achievement took years of aligned vision and hard work by every squadron member, and the common belief that "Zero Accident is an indicator of operational capability."

Introduction

143 SQN was established in 1975 and first operated the A-4 Skyhawk from Changi Airbase and then Tengah Airbase. In the late 1980s, it was the first squadron to operate the newly upgraded A-4 Super Skyhawk. In 1997, 143 SQN relinquished all its A-4 Super Skyhawks for Advanced Jet Training in 150 SQN and was disbanded. 143 SQN was subsequently reformed in 2000 to operate the F-16C/D fleet and adopted the insignia of a "Phoenix" spreading its wings, with the motto of "We Dare".

Today, 143 SQN conducts a wide spectrum of air-to-air and air-to-ground missions, and maintains a high level of operational readiness to support air defence operations. This includes maintaining frontline air defence operational responsibilities, which saw her responding expeditiously to the bomb threat on Singapore Airlines flight SQ423 and escorting it to land safely in 2019. 143 SQN also actively participates in local and overseas exercises, such as Ex BERSAMA LIMA, Joint Military Training with the Indian Air Force (IAF) and multinational Large Force Employment (LFE) Ex PITCH BLACK, in order to sharpen its operational and combat edge.



As the tip of the spear for the RSAF, the pressure to push boundaries and raise competent pilots in order to achieve mission success for the RSAF is immense. To do so, safety must be deeply ingrained and second nature to the Phoenix family. This is achieved through two main key thrusts:

1. Strong Command Emphasis
2. Demanding High Standards and Competencies

Strong Command Emphasis

A strong command emphasis drives the correct mentality and consequently the desired behaviour of the squadron members when it comes to safety awareness. The continued interweaving of clear, consistent safety messages and intent

into processes and operations helped build up the safety culture in 143 SQN over time. This is primarily done through safety in processes, daily planning, and open communication.

Safety in Operational Processes

Elements of safety awareness permeate through all levels of the squadron's daily operational routine, from daily operations brief, execution of operations room and duties, down to mission briefs and debriefs. Every individual is intimately involved in the safe execution and outcome of these processes.

For example, aircrew are nominated during daily operations briefs to discuss the latest FAIR/GAIR incidents. Guided by the Unit Safety Officer and

deputy Unit Safety Officer of the squadron, they review the occurrence summary and relevant lessons learnt in detail to sieve out the pertinent and valuable lessons for the squadron. When sharing incidents from units beyond Fighter Group (FG), they would be required to draw lessons that are applicable to the squadron's operations, and/or suggest areas of operations where the root cause of failures can occur to the squadron. This puts them through a more complete thinking process, one which applied learning is achieved.

To raise individual's awareness of watch areas of increased risks, Flight leads would brief the mission specific Special Interest Item (SII) during operations brief. This allows individuals to raise their SIIs openly and allows the entire team of Squadron Executive Officer (SXO),

Flight Supervisor, down to the Wingman to accord the necessary focus, and apply mitigation factors if necessary. Additionally, we can gain insight on the concerns of other team members, and recognise how the SII may indirectly affect us for future missions.

Daily Operational Planning

The belief that "Zero Accident is an indicator of operational capability" anchors the approach and attitude to which the squadron manages the planning of squadron operations. As the squadron has to balance training and a number of operations such as air defence operations duties, safety is paramount in tactical planning.

Central to this is the Monthly Operational Plan (MOP). The MOP is constantly calibrated by the squadron leadership to balance training



requirements against the operational tasking requirements. This manages the operational tempo of the squadron, while forecasting areas of increased tempo which would increase fatigue, or 'chokepoints' which allows forward planning to reduce late changes to game plans and thus induced rush factor.

For planning of daily flying, the Officers Commanding of the squadron actively identified limitations in the planning process and improved upon it. Like most flying squadrons, 143 SQN's scheduler used to

plan the daily flying schedule using an Excel spreadsheet, thereafter relying on a secondary layer of checks by the operations duty officer to verify the validity of aircrew's currencies, followed by the system-level checks as the final layer of check.

Upon review of the planning process, the schedulers improvise the secondary layer of checks. Instead of relying on different operations duty officers each day to counter check the planned schedule, the currencies of all aircrew are linked (via Excel formulas) to the Excel spreadsheet used for planning.



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This allowed the currencies to be counter-checked immediately and automatically during the planning stage itself, reducing the inefficiencies of manual checks and bypassing limitations where the schedule was planned on a non-flying day without a secondary layer of check by the operations duty officer.

This had effectively prevented the squadron from scheduling aircrew with lapsed currencies right from the planning stage, thereby trapping any errors earlier. While the system and individuals remain the final layer of checks in the planning process, this improvisation has reduced workload, while decreasing the chances of lapses in currencies management during the planning stage.

Open Communications

Communications within 143 SQN have always been open, objective, and respectful. These characteristics have allowed even the most junior aircrew in the squadron to raise concerns regarding the compromise of safety boundaries or 'at-risk' behaviour, without fear of judgement. As a relatively small fighting unit, the squadron management understands and values the contribution of each individual, and has always encouraged open communication within the team. Therefore, the squadron adopted a culture of being objective and impartial

towards all individuals, with the aim of tackling incidents and issues at its root causes. With this culture, individuals are committed to the open sharing of lessons learnt, errors committed, and 'at-risk' behaviour, which in turn raises awareness and helps to prevent the next incident from occurring.

The open sharing of lessons has been actively practised in 143 SQN. According to the "Iceberg" theory (Figure 1), it states that for one accident to occur, a total of more than 1511 serious incidents, incidents, and near misses would have occurred. This set of glaring numbers prompted me to actively encourage the open sharing of both positive and negative lessons and incidents, so that we can (1) uncover latent issues if necessary, (2) ensure timely and effective sharing of lessons, (3) proactively prevent instead of reacting to the next accident/incident.

For example recently, one of our junior pilots LTA Lee Kiang Hui shared with the squadron that before taxiing his aircraft from the parking dispersal, he saw that the Assistance Flight Line Crew (ADCC) was walking within the projected taxi path of the aircraft's wingtip. This prompted him to stop his aircraft and gain the attention of ADCC to keep clear, before continuing to taxi. LTA Lee then





Figure 1. Iceberg Theory

informed the duty personnel, who was able to correct the individual, bring awareness to the entire logistics team, and delve deeper into the training standards and trending of individuals. Because of LTA Lee's sharing, the entire squadron gained awareness of the SII and the importance to clear the path of the aircraft, especially when taxiing in a confined space. This cautioned all aircrew that the risks are constantly out there, thereby there is a need to adopt a 'Defensive Flying' mentality. This was an instance of positive lesson sharing embraced by the squadron: one which did not lead to an accident, incident, or even a near miss, but one which would have caused disastrous injury to our servicemen should the aircrew not have been vigilant that day.

Demanding High Standards and Competencies

Standards and Safety are critical pillars to mission success. In 143 SQN, we firmly believe that 'A chain is only as strong as its weakest link'. Therefore, we place strong emphasis on the standards of every single aircrew, demanding the most of them in their respective experience and qualifications. Demanding high standards and competencies in our aircrew have ensured that our capabilities are able to meet or exceed operational demands, thereby decreasing the





chances of 'at-risk' situations we may put ourselves in. Furthermore, as the squadron partakes in several high end deployments such as Ex PITCH BLACK and Joint Military Training, it is imperative that everyone in the squadron is fully capable of executing their missions to high standards. To do so safely, the squadron emphasises on phased training and quality of instructional competencies in the squadron.

Phased Training

The systemic move towards Phased Training in FG has allowed 143 SQN to accord dedicated training to our aircrew, while taking an incremental approach towards training for the squadron. This greatly enhances the focus on specific mission skill sets and allows the squadron to hone these skills thoroughly before moving on to another. Given the multitude of skill sets required of a fighter aircrew, the phased training sets the focus for a specific period, establishes stability in flying scheduling, and allows aircrew to better prepare for the

missions, thereby increasing the margin of safety with quality of preparation. The dedicated training also sets the entire squadron on a common page, strengthening the depth and breadth of knowledge and flying techniques, unlike previous training modalities used by the squadron where the mission type flown were too dynamic on a day-to-day basis.

The flexibility to adjust the phased training periods allows the squadron to increase the amount of focus when required, ensuring that our aircrew meets the desired proficiency prior to embarking on a new phase. With the squadron's Fighter Weapons Instructor (FWI) determining the pulse of the training scenarios, 143 SQN has been able to scale the complexity of scenarios, while ensuring an incremental approach towards training. Furthermore, the squadron can also go out of sync with the phased training to tackle other specific issues an individual may face. Therefore, the squadron has been able to achieve valuable training outcomes without compromising on the standards, and certainly not leaving any weaker aircrew behind.



Quality of Instructional Competency

A Training Management Team was set up as a platform for the squadron instructors and Management to enhance the performance of all aircrew, and identify areas with gaps and improvement in the training system in the squadron. This allows the timely and detailed sharing of errors committed by individual aircrew, and helped sieve out poor flying habits which would otherwise not be apparent nor tracked through every other ungraded sortie. This platform raised the instructors' awareness on individual aircrew's performance, and allowed instructors to actively guard against the errors, or provide timely intervention when required. The cross-sharing further provided instructors the opportunity to review their personal in-flight take-off criteria through the experiences of others, and improved the quality of instructional techniques.

Additionally, instructors leverage available backseat sorties as Continuous Training (CT) sorties to hone their individual proficiency. Using these backseat sorties with another instructor, they can work on skill sets which normally would not be practised when flying with squadron pilots, such as circuit flying. Sorties can also be used for an instructor to work on areas of improvement. Instructor Pilot (IP) Mutual sorties also allow senior instructors to highlight safety watch areas to junior instructors when embarking on new phases, in order to execute the training for the rest of the squadron safely. This had proved successful in allowing the squadron instructors to push the training standards while keeping within safety boundaries.

Conclusion

The strong safety culture in 143 SQN had given her 30 years of accident-free flying whilst fulfilling the spectrum of operational demands. Everyone in 143 SQN understands their contribution to the air defence of Singapore and is filled with the determination to pursue excellence regardless of the accolades. Due to the inherent risks involved in fighter flying, we understand that a single lapse in concentration or moment of complacency could lead to a catastrophic outcome for the squadron. With the increasing complexity of operational tasks and operating environment, 143 SQN will continue to place strong command emphasis, demand and uphold high standards, and stand ready to face the challenges ahead while ensuring safety is not compromised at all times. ***Mission Success, Safety Always. "We Dare!"***.



ABOUT THE AUTHOR

CPT Leow Yee Shiang is a CAT A Qualified Flying Instructor in 143 SQN.

He holds the appointment of USO and DY Training Officer, and is qualified as a Squadron Executive Officer.



Watch out for 'Aster Bites': Instituting Safety Practices for Aster 30 Operations



CPT Nathaniel Wong
Air Weapons Officer
(Air Defence Weapons)
163 SQN

163 SQN is home to the latest Ground-Based Air Defence system in the Republic of Singapore Air Force (RSAF) – the Aster 30 Medium-range Surface-to-Air Missile (MSAM) system. In February this year, I joined the squadron as a Fire Unit Commander in an Aster 30 flight. Working alongside me are a team of operational crew comprising both regulars and NSF officers, warrant officers, and specialists. Together, we operate the Aster 30 system to provide the RSAF with the high and medium altitude air defence capability from the ground. As a Fire Unit Commander, my primary role is to ensure that my Fire Unit can effectively operate the Aster 30 system, facilitate mission success and provide command emphasis on safety and quality in our day-to-day work.

In 2013, the RSAF announced that the Aster 30 system would replace the I-HAWK as part of the Integrated Air Defence (IAD) capabilities, and provide 24/7 air defence of Singapore's airspace. As a key component, the Aster 30 system plays a vital role in guarding Singapore against any potential threats from the air. The Aster 30 Missile System is the latest air defence system in the RSAF and it is an all-weather, next generation medium-range surface-to-air missile system. With its anti-aircraft and anti-missile capabilities, the system is able to counter a wide spectrum of air threats, with an enhanced awareness and responsiveness afforded by its deep integration with the RSAF's IAD network.



ARTICLE

While Aster 30 is a technologically advanced and highly capable system, operationalising it is not without its challenges, as the equipment is complex by nature, highly automated, and large in size. In 163 SQN, we wittily call the safety hazards that we encounter when operating the Aster 30 equipment as “Aster Bites”, a nod to the safety term “aircraft bites” that is used more commonly in the aviation domain. For our equipment, “Aster Bites” can range from electrocution hazards to fall hazards as well as pinch hazards from mechanical parts. Aster 30 crews are required to work from taller heights as compared to their I-HAWK counterparts, and operation of hydraulics and automated components poses additional risks. It was clear that these challenges needed to be addressed for the squadron to execute its air defence mission with a high degree of assurance to the safety of her crew and her equipment.

One new “Aster Bite” involves our crew having to work from heights exceeding two metres from the ground. The large size of the Aster 30 equipment meant that it is inevitable for our crew to work from heights as part of our operational and maintenance routines, which exposes our crew to the risk of falling. To improve work safety while performing these tasks, the wearing of a harness with a fall arrest system is mandated for all work at height. In addition, each crew that is about to work at a height has to be cross-checked by another crew member for the serviceability and proper wearing of their harness before they can commence any climb to a high surface. Once ascended, the crew member will attach themselves to a fixed point so that any fall would be arrested by the harness system. By instituting compliance checks and adhering to safety regulations, a



culture of wearing harnesses when working from heights was fostered in our squadron, which mitigates the risk of dangerous fall injuries.

The operation of heavily automated machinery, including hydraulics, also poses a serious risk of crush-related injuries. For example, the Aster 30 Launcher Module features hydraulic arms and legs that extend and retract within mere seconds. A person working in close proximity to these moving hydraulic components is exposed to crush hazards – namely the risk of being crushed by mechanical components if caught in the wrong place and the wrong time. Because of the high level of risk associated with this operation, at least two safety lookouts are required to be present when any hydraulic components are operated on the Aster 30 system. These lookouts cover the blind spots of the hydraulic operator. The operator verbally checks with both safety lookouts prior to each and every hydraulic operation that the area surrounding the equipment is clear of personnel and foreign object debris. The verbal communication between crew members acts as an additional layer of checks, providing assurance to the operator that the area has been actively cleared at all points of the hydraulic operation. By building in this requirement as a feature in the standard operating procedures, a clear message is sent to all operators that safety is at the heart of a well-executed operation and cannot be left up to chance as an optional afterthought.

Looking back on these short months, I am proud of what 163 SQN has achieved thus far in her journey of operationalising an IAD system as complex as Aster 30 in a short number of years. This process has also given the squadron the opportunity to imbue a





safety culture from a clean slate by designing procedures and practices from first principles with safety in mind. While designing these new work processes, we can apply best practices learnt from both within the squadron and throughout the RSAF. The work routines established are safe and effective in achieving the unit's assigned mission, avoiding "Aster Bites" pre-emptively before needing to learn safety lessons the hard way. Even with the tireless focus on safety, there remains room for innovation and process improvement, as seen in the simple and impactful adoption of hard hats in maintenance work. As the squadron presses on towards Full Operational Capability of the Aster 30 system, it is paramount that safety remains foremost in the minds of our personnel to secure the longevity of a safety culture that accompanies, or perhaps even transcends, the lifespan of the Aster 30 system.

Having been taught the fundamentals of operating the Aster 30 system expeditiously and safely, I can confidently say that I need not fear the "Aster Bites" faced in our day-to-day work. What matters most is that my team and I continue to hone our operational skills and ensure that complacency does not set in during the course of our work. As the 163 SQN motto goes, "Above the Best"!



ABOUT THE AUTHOR

CPT Nathaniel Wong is a Fire Unit Commander from 163 SQN. As a CAT C qualified Weapon Controller, he contributes to the operation of the Aster 30 Ground-Based Air Defense system, while overseeing his Fire Unit's training and welfare. He holds a Master's degree in Computer Engineering from Northwestern University.

Chief of Air Force Safety Award



2WO Damien Yeo (left) receiving his award from MG Kelvin Khong (right).

On 27 May 2020, 2WO Damien Yeo was involved in an Army trooplift and underslung tasking mission where he was reviewing the Inspection Record form given to him by the Army unit which showed that the rigging checklist had been completed by the Army rigger and certified by the Load Inspector. Although it was not his duty or responsibility, 2WO Yeo showed strong safety instincts and took the initiative to conduct a physical check on the load prior to embarking it onto the aircraft. During the checks, he found that the chain end for one of the 25,000lbs slings legs on the Light Strike Vehicles were not properly looped through the grab hook. He later discovered that the chain end of the sling leg was only taped to the grab hook which deviated from the proper procedure. 2WO Yeo highlighted the incident to the Aircraft Captain and recommended that they reject the load due to the safety hazard posed.

2WO Yeo's safety instinct and professionalism helped to break the accident chain as he was the last man to arrest the error before the underslung load was lifted, which would have impacted the centre of gravity of the aircraft to be tilted disproportionately during the load pickup. For his strong safety instincts and exemplary actions in preventing a potential and costly accident, 2WO Damien Yeo was awarded the Chief of Air Force Safety Award.

02/20 CAF Quarterly Safety Forum

To adhere to the COVID-19 safe distancing measures, the 02/20 CAF Quarterly Safety Forum was held on 1 Oct 2020 via Video Tele-Conferencing, which saw over 300 personnel participating from more than 30 locations in our RSAF air bases and camps. The forum allowed our personnel to understand the RSAF's safety performance in the last quarter, discuss and share the safety incidents/issues that occurred, and be aware of the watch areas to look out for in 3Q WY20/21.



OFFICIAL (OPEN)

BIRD HAZARD INTERVENTION PROGRAMME

1 Oct 2020

Bird Migratory Season is here!

Last year around this period, we saw a large flock of Asian Openbill Stork arrived from as far as Thailand and Indo-China regions. Measuring 68cm tall and up to 81cm long, birds of such size are dangerous to our flying operations, especially when they are flying in large flock.

In Sep 20, bird watchers have observed that different species of migratory shore bird activities in Singapore northern wetland areas and this might signalled the start of the migratory season for this year.

Migratory Patterns in our Region

The East Asian-Australasian Flyway migratory pattern which covers part of Indo-China regions, Thailand, Western Peninsula Malaysia and Singapore to the north of the equator as well as Indonesia and Australia to the south of the equator.

Asian Migratory Bird Flyways

East Asian-Australasian Flyway

West Asian Flyway

South Asian Flyway

OFFICIAL (OPEN)

1/11



To enhance the overall safety learning experience during the 02/20 CQSF, a decentralised learning approach was adopted, where safety materials were disseminated to the participants prior to the forum for them to learn at their own free time. Some of the materials shared during the forum were the enhanced safety educational package on bird hazards, and safety sharing videos from personnel relating their personal experiences on how they overcame and averted their dire situations/emergencies at work safely. Additionally, online polls and quizzes were conducted to foster a more interactive learning environment.

AFSEC - AFI Safety Sharing



To strengthen the safety relationship between the United States Air Force (USAF) Air Force Safety Center (AFSEC) and the RSAF Air Force Inspectorate (AFI) during the COVID-19 pandemic, the AFSEC-AFI safety sharing session was conducted on 15 Sep 2020 via Video Tele-Conferencing. The session allowed safety personnel from both Air Forces to interact and share safety-related issues with each other, such as the recent Human Factor trends and developments in Safety Information Systems.

Annual Safety Workshops

To ensure that the RSAF safety focus areas, trends and watch areas could continue to be disseminated to the various Type Groups amidst the COVID-19 pandemic, the Annual Safety Workshops were carried out via Video Tele-Conferencing with safe distancing measures observed. The workshops also allowed the cross-sharing and discussion of significant incidents, safety experiences and safety concerns between the participants and AFI.



UAV Group / 24 Jul 2020

Transport Group / 6 Aug 2020

Force Protection / 16 Sep 2020



Fighter Group / 27 Jul 2020

Heli Group / 20 Aug 2020

C3 / 28 Sep 2020



4 Pics 1 Word

What word can you derive from the 4 pics?



1



2



3

--	--	--	--	--	--	--	--



4

M	R	I	T	D	N	U
O	M	S	Y	C	I	E



5



6



7

--	--	--	--	--	--	--



8

P	C	A	R	E	L	N
A	O	G	F	D	Z	H

We welcome your feedback, contributions of safety related stories, cartoons, suggestions, experiences or concepts you could share. Email us at apb_pub@defence.gov.sg with your full name, and contact number.

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1. "Injection" by Chris Tribe
2. "Antivirus" by Richard Patterson
3. "gas masks" by João Ferreira
4. "drain" by Chris Luczkow
5. "Viper" by Ville Airo
6. "coronavirus" by calendar news
7. "Crocodile" by Vortex2000
8. "Happiness" by Samantha Strohbehn

Permission granted by LOTUM GmbH to publish 4 Pics 1 WORD in FOCUS

WIN!
S\$30
WORTH OF
VOUCHERS!

Crossword

Email your answers with your Rank/Name, Unit, Contact number and last 4 digits of your NRIC to AFI (ME3 Tan Tee Hoo) by 8 JAN 2021. All correct entries will be balloted and 3 winners will receive S\$30 worth of NTUC FairPrice vouchers each.

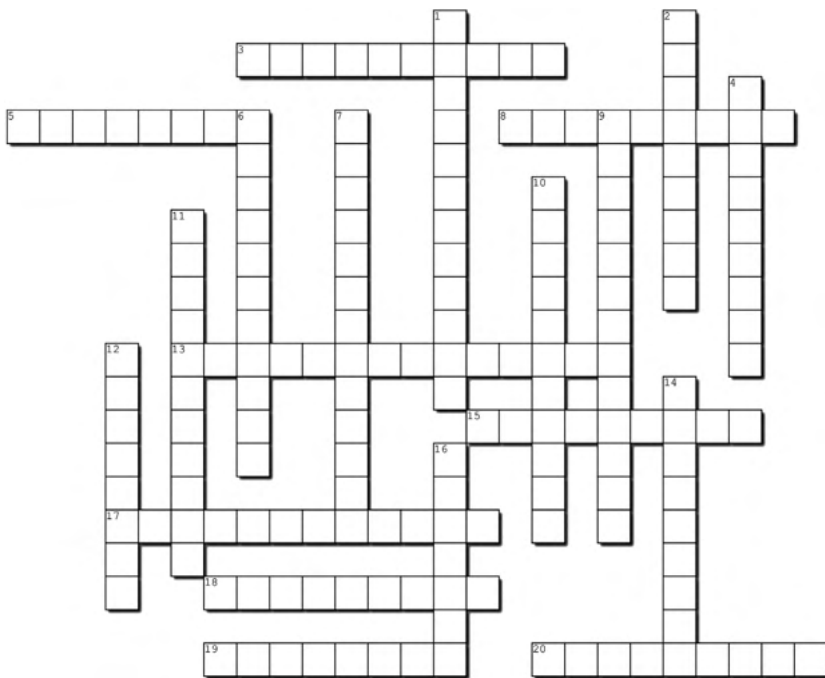
The crossword puzzle is open to all SAF personnel except personnel from AFI and members of the FOCUS Editorial Board.

FOCUS 104 WINNERS

ME2 Woo Ying Bei
6 AELG

LCP Bryan Ang
DIV 9 HQ

ME2 Chan Wen Jun
HQ1388



Across

3. With no prior experience, the preparation for the servicing was filled with several _____
5. However, the outbreak of the COVID-19 _____ placed the world close to a global lockdown
8. The open sharing of lessons has been actively _____ in 143 SQN
13. Upon arrival back to Singapore, they started laying the foundations to _____ the A330 MRTT
15. ...and the RSAF entered into cohorting to ensure operational _____ was not compromised
17. Having been taught the _____ of operating the Aster 30 system expeditiously and safely,
18. The systemic move towards Phased Training in FG has allowed 143 SQN to accord _____ training to our aircrew...
19. To tackle the _____ demands placed on the limited manpower,
20. One new "Aster Bite" involves our crew having to work from heights _____ two metres from the ground

Down

1. The continued _____ of clear, consistent safety messages and intent into processes and operations helped build up...
2. For example, aircrew are _____ during daily operations briefs to discuss the latest FAIR/GAIR incidents
4. Such training is _____ for the AFEs to have a deeper understanding of the system as they embark on performing the maintenance
6. I continue to hone our operational skills and ensure that _____ does not set in during the course of our work
7. As for the third key area on _____ checks, the logistics acceptance team also reviewed all the aircraft documents
9. The Safety Vision and Beliefs of the IWF can also be _____ by means of the DuPont Bradley Curve
10. We would have to look ahead into the future and focus on creating a _____ environment for future generations...
11. Even with the tireless focus on safety, there remains room for innovation and process _____
12. Looking back, it has been an _____ journey.
14. ...where the _____ traits of the workforce, forms the backbone for Operational Excellence
16. ...their _____ and most importantly an assessment of the alignment in values

Answers to page 30: "IMMUNITY" and "DANGER"

IF YOU DRINK



CHOOSE ONE



YOUR CHOICE