BALANCING OUR STRATEGIC RESOURCES AND 3RD GENERATION RSAF MISSION IMPERATIVES

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In the face of a struggling European economy, the British announced on 18th July 1967, its plans to reduce its military commitment to the Far East Command and to pull its troops out of Singapore by the mid-1970s. This event, as well as the Japanese occupation of Singapore during World War II, reminds us of the importance of a strong defence force. This defence force needs to be made up of people with a genuine and imputable interest for its success—our very own citizens. Despite being a third-world nation with an extremely fragile local economy, our political leadership has placed an emphasis on building up a strong defence force in the 1960s. As a result, a sizable portion of our limited resources was dedicated to this cause.

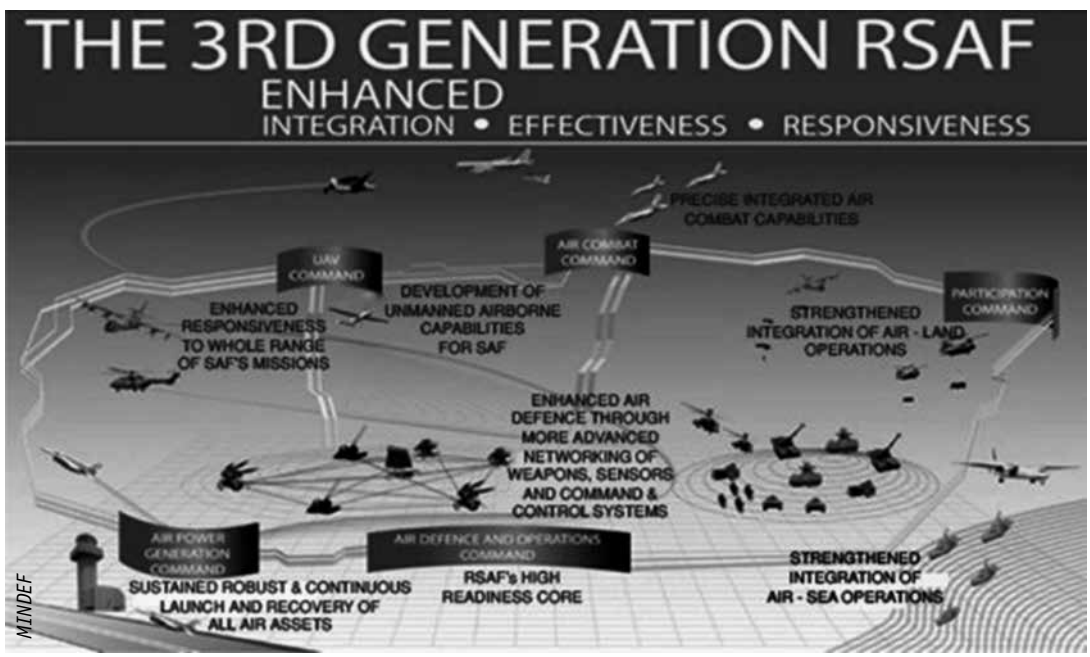

Figure 1: The Evolution of the RSAF.

The SAF was set up in 1965 with the clear mission *to enhance Singapore's peace and security through deterrence and diplomacy, and should this fail, to secure a swift and decisive victory over the aggressor.* Being a critical component of our national security, the RSAF fulfils this mission by being a credible and respected Air Force, one that is always ready for operations 24 hours a day, 365 days a year. It was clear that with only two Cessnas

borrowed from the Singapore Flying Club, the immediate priority in our formative years was to build up the capability to have some form of basic air defence. The RSAF achieved this through the acquisition of assets to deal with internal and external threats. Having those foundations, we started to focus more on higher-valued assets to strengthen our component competencies as an Air Force during the 80s and 90s. The needs and priorities of the RSAF continue to evolve as we mature, and today, we focus on enablers that allow all the individual components to fight as a collective unit, through the development of network-centric capabilities in our 3rd Generation Air Force.

Figure 2: Republic of Singapore Air Force C-130 Transport Aircraft, that was deployed to assist in the search-and-locate operation for the missing MH370, returned to Paya Lebar Air Base at the end of the search.[1]

As we enjoy the peace dividend from the past 50 years of independence, it is important that we remember that the need for a strong RSAF, and the larger SAF, has not changed. We only need to look at the turmoil in Ukraine and the insurgency by the Islamic State in Iraq and the Syria (ISIS) in 2014 to be reminded of this strategic reality. In addition, the RSAF's value in peace has also expanded over the years to include Peace Support and Humanitarian Aid and Disaster Relief (HADR) missions. Examples of the RSAF proving its value in peace include the RSAF deploying four UH-1H helicopters in support of the United Nations Mission of Support in East Timor (UNMISET) in 2003, as well as deploying eight CH-47 Chinook and four Super Puma helicopters, six C-130 transport aircraft, and two Fokker F-50 utility aircraft for Operation Flying Eagle in response to the Asian Tsunami in 2004. More recently, it was announced that the RSAF would be contributing to the global

fight against ISIS in the Middle East by committing liaison and planning officers, a KC-135R air-to-air refuelling aircraft, as well as an imagery analysis team.

In order to maintain our readiness and capability to perform our tasks when called upon, the RSAF will need to be resourced properly. However, the RSAF is cognisant that being a small nation, our limited strategic resources in terms of budget, manpower and geographical space, needs to be balanced at the national level, between defence, as well as economic and increasing social demands.

GOOD STEWARDS OF OUR NATIONAL RESOURCES

As a responsible steward of our national resources, the RSAF practises long-term planning to take stock of its current capabilities, identify any gaps in the future operating landscape and the resources that are needed to meet those needs. In addition, to facilitate the optimisation of resources at the SAF-level, the RSAF conducts its long-term planning together with the Army, Navy as well as Joint Staff.

Figure 3: Long-Term Planning Strategy.

RSAF, through MINDEF, works with other Ministries and Statutory Boards to ensure steady and prudent investments in defence, balanced against our national needs in the economic, social and foreign affairs realms. As a nation, given the stable and peaceful

environment we enjoy, we are very fortunate to be able to plan for the long-term. With this strategy, the RSAF is able to fulfil its mission by developing for the future and remaining relevant in our operational capabilities and roles.

We do not need to look very far back to witness how this strategy has proved effective. The RSAF was able to proceed with our plans to modernise our fighting platforms as part of the RSAF's 3rd Generation transformation despite the economic downturn in the region in 2008. This allows us, as a nation, to not only 'make hay when the sun shines,' but to a certain extent, 'make our own sun to make the hay.' We shall now look closer at the three key resources that the RSAF needs—budget, manpower, as well as training areas.

BUDGET

In terms of budget, our national approach is to constantly set aside up to 6% of our GDP on defence and this steady defence spending allows the SAF to prevent a 'feast or famine' phenomena, allowing us to plan ahead and avoid hasty acquisition of sub-optimal and yet expensive solutions to security issues when the economy is doing well and conversely, having to compromise security capabilities in the medium term because of an economic downturn.

While there is strong support for continued investments in defence and acknowledgement that Singapore's defence spending might be high but necessary, there have been increased scrutiny on the defence budget, with some questioning if more can be allocated to fulfill social needs. The wisdom of history however, teaches us that peace is very fragile.

Kuwait is a good example of this wisdom. Despite being a close ally in a war barely two years prior, having a strong bilateral relationship and providing strong financial assistance to its neighbour, Kuwait was invaded by Iraq in 1990. Even when we look at our own short history, we are once again reminded, through the Indonesian ship-naming of *Usman Harun* episode and of *Konfrontasi*, which was conducted by Indonesia in protest to the formation of Malaysia in 1963. This resulted in civilian deaths and damage to property in Singapore, with 29 bombs going off. Recently, the naming of the Indonesian frigate after the two Marines involved in the bombing of MacDonald House reminded us that warm bilateral relationships can turn sour without any warning.

Additionally, there are other groups that, while convinced of the need for an Armed Force, are not quite convinced of the need for the continued emphasis on defence expenditure, noting that the RSAF has already established itself as a formidable Air Force. At this point, it is useful for us to remember this saying, "if you remain stationary in a world that is constantly moving, you are in reality retreating." A survey by the Stockholm International Peace Research Institute (SIPRI) on military expenditure in Asia and Oceania shows that it had more than doubled, from US$247B to US$407B, in the last 10 years.[2] Closer to home, the defence expenditure of Malaysia, Indonesia, Philippines and

Thailand grew between 50% to over 300%, as the table on the next page shows, and it is likely that the rate of defence spending will continue as the economy of these countries are forecasted to grow between 5% to 6% according to the report by the Deloitte's Global Defence Outlook for 2014.[3]

	Defence Expenditure (in 2011 US$ Billion)		Percentage Increase
	2000	2013	
Australia	17,994	23,963	33%
Indonesia	1,925	8,356	334%
Malaysia	2,442	4,809	97%
Philippines	2,086	3,208	54%
Thailand	3,180	5,622	77%

One of the reasons for the escalating defence expenditure is the increase in the cost of military equipment over the years. A case in point is combat aircraft. The F-16 cost US$14.6M in the 1990s, while the current estimated price of the F-35 is US$153M. Even if inflation is factored in, the cost of the F-35 exceeds the F-16 by more than three fold.

However, to ensure prudence in our defence expenditure, the RSAF does not only depend on the acquisition of new equipment for our technological refresh. Instead, we look objectively at our operational requirements based on our projected threats and

Figure 5: Multi-Role Transport Tank as an Example of Platforms with Multiple Capabilities.

requirements and thereafter across the entire solution spectrum, from maintaining and upgrading the current equipment, to acquiring new hardware, before deciding on our course of action.

This mechanism looks at the comparable life-cycle cost of the solution, taking into consideration factors such as the escalatory cost of maintenance and manpower cost, projection of potential technological development at the global-level, as well as the trajectory of our R&D advancement in a realistic timeline. These factors are rationalised at both the intra and inter-Services level, to ensure that resources are duly optimised, while allowing for the growth of our local industries.

By rationalising at the Joint-level, there is potential to reap multiple benefits from the same platform and we have had many examples of this strategy. One good example is the C-130 aircraft that is able to conduct search and locate missions as part of our national Flight Information Region (FIR) responsibility, Air-to-Air Refuelling (AAR) to allow our fighter aircrafts to travel further without landing for fuel and provide aerial resupply for our Army troops. Looking into the future, likewise, our new acquisition, the Multi-Role Transport Tanker (MRTT), will be able to provide multiple capabilities such as long range transport capability as well as AAR capability to support the RSAF and our sister Services, as well as enhancing our response to HADR situations with the ability to carry more load, with a shorter response time and over a longer range.

MANPOWER

Even as the RSAF places emphasis on technological advancement, manpower, made up of full-time Regulars, NSmen and NSFs, continues to be our key capital. Just like in the case of budget, the RSAF is cognisant that it has to share this critical resource with the other areas of national development. This supply, however, has been reducing over the years, with the number of resident live births in Singapore dropping from 40,100 in 1980, to 35,129 in 2010, coupled with the ratio of the Singapore population being male, between the ages of 15 to 44 dropping more than 10%, from 55.3% to 44.1% from 1980 to 2013.[4]

On a positive note, there has been a change in the academic demographics of the Singapore population, with the percentage of our population being tertiary-educated increasing from 2.7% in 1980, to 25.7% in 2012.[5] We see great opportunity in this and have been leveraging on this strength to develop our capability, by bringing in sophisticated technology that can be operated by highly educated and trained personnel, developing concepts to better utilise them as a network, pushing new boundaries of technical capability and automating mundane tasks, to allow our people to do higher-valued work. One such platform that the RSAF has inducted recently is the Surface-to-Air PYthon and DERby (SPYDER) Ground-Based Air Defence System, which replaces the legacy Rapier.

Figure 6: Manpower Savings through Employment of Technology.

Another trend in the population is the increase in the life expectancy, from 67.8 in 1970, to 84.5 in 2012, with the median age increasing from 24 to 37 in the same timeline.[6] In this, we see another opportunity to retain knowledge and expertise through the introduction of the Military Domain Expert Scheme in 2010. This allows personnel from selected vocations that require deep expertise and wide experience a longer period of 'gestation time' to contribute to the organisation at their peak for a longer period of time.

Other than the traditional manpower of full time Regulars, as well as NSmen and NSFs, the RSAF has, over the years, explored alternative sources of manpower to meet our operational and training requirements. One such example is the outsourcing of non-core work, such as maintenance of buildings and even selected core tasks to our trusted industrial partners in Singapore Technologies to meet our defence needs. Not only do we reap efficiency through their economies of scales to decrease the national overheads, but we also gain innovation through discussion and sharing of technological and industrial best practices.

As alluded to earlier, technology has been harnessed by the RSAF to reap better efficiency and free our manpower for higher-valued work. A good example of innovation and leverage on technology is the RSAF's Enterprise System, implemented in April 2007 to manage our logistics requirements. This system permits the accurate tracking of the items in our inventory and flags out when an item requires replenishment, thereby

cutting down on manpower hours. In addition, it enhances safety through the timely notification of components parts that are coming close to their shelf life or require maintenance overhaul, thereby preventing non-serviceable parts from being installed in the operational platforms.

Another initiative taken by the RSAF to optimise our human resource is restructuring, both at the macro-level, as well as the micro-level. In 2006, the RSAF initiated an Air Force-wide restructuring exercise, to enhance integration across the entire RSAF, allow for a flatter and more dynamic Command and Control structure and permitted seamless transition in peace-to-war continuum, i.e. allowing us to 'train as we fight'.

In addition to improving operational capability, the restructuring allowed the consolidation of operators and equipment of similar tasks, thereby permitting better consolidation of training, operational and logistic requirements across the entire RSAF, better doctrinal development and emphasis, with lower overheads. Moreover, intrinsic in the structure is the scalable and modular capability of units that allow our Commanders to flexibly configure our forces according to specific mission demands, thereby permitting increased sustainability of our manpower by activating only components that are absolutely required for the particular operations. Also, because the organisational structure already mirrors that which would be used in operations, less resources are required for component level training, but instead, more emphasis can be placed on higher-valued system-level training and development.

LAND USE AND AIRSPACE

The RSAF requires land to house our operational infrastructure, to accommodate our troops and equipment and for training. However, with a limited land stock and, just like budget and manpower, the land portfolio would need to be carefully balanced with the other national requirements. Currently, while the RSAF utilises a small portion of our national land stock, it is in constant communication with the Urban Redevelopment Authority (URA), to ensure that it is optimised at a national level, without compromising our requirements.

One major decision made recently with regard to the rebalancing of land use is the planned relocation of Paya Lebar Air Base. In terms of economic and domestic impact, an extensive amount of land (more than 500 ha) can be redeveloped for housing, offices and social purposes. In addition, the height restriction for the surrounding areas (because of the approach paths of the aircraft into Paya Lebar Air Base) would be lifted, removing the height restriction for the buildings in the surrounding areas, giving tremendous potential for multi-purpose high-rise buildings in land-scarce Singapore.

However, as the guardian of our sky, and to ensure that our ability to defend Singapore is not compromised when we relocate Paya Lebar Air Base, plans are to be made for the expansion of both Changi Air Base and Tengah Air Base. The RSAF also looks upon this as an opportunity for innovation and creative planning. We will utilise technology to

increase the efficiency of our launch and recovery operations and enhance the protection capabilities and redundancy of our airbases. By leveraging on these growth areas, in addition to ensuring that there will be no degradation in our operational capabilities, the RSAF will be able to do our bit to support national development and at the same time, emerge stronger.

Moving ahead, at a strategic level, the RSAF, together with members of the local defence ecosystem and inter-ministerial agencies, are looking at alternate spaces such as exploring underground or even unconventional spaces, such as above roads and reservoirs, for administrative and operational uses. This is not new as selected functions are already utilising underground caverns, including the Mandai Ammunition Storage Facilities. Nevertheless, there is potential for more to be done.

However, land is only part of our training requirements, as our pilots need airspace to hone their skills and fine-tune tactics and concepts of operations. Given Singapore's small size, the RSAF also has to contend with limited airspace over our island that our pilots can train in. Therefore, other than our local training airspace, the RSAF leverage on our partner nations to conduct both long-term and periodic detachments in their lands. Examples of permanent detachments include operational training detachments such as Peace Carvin II, Peace Carvin V, Peace Prairie and Peace Vanguard in the United States (US), housing the F-16s, F-15s, CH-47s and AH-64s respectively, as well as the flying training detachments, such as the Air Grading Centre, 130 Squadron in Australia and 150 Squadron in France for air grading, basic and advanced fighter pilot training, respectively. Additionally, we conduct periodic detachments to countries like Australia, New Zealand and Thailand. More importantly, we conduct unilateral large scale, cross-Service exercises, such as *Exercise Wallaby* and *Exercise Forging Sabre* and participate in both bilateral and multilateral exercises such as *Exercise Cope Tiger, Exercise Kiwi Flag, Exercise Red Flag* and *Exercise Indopura*, to exercise our concept of operations, enhance cross-Service integration with our Army and Navy counterparts and increase our interoperability with our partner nations.

However, this availability to overseas training areas cannot be taken for granted and is subjected to several factors such as geopolitical sensitivities, domestic pressures and global politics. Notwithstanding, the RSAF will continue to explore new areas and innovate ways to meet our training requirements.

Another strategy the RSAF employs to mitigate the lack of training airspace is to utilise simulators to create virtual space to meet our training requirements. Simulators are an important component of RSAF training, as not only does it overcome the lack of physical airspace, it allows cost-effective training of RSAF personnel in realistic scenarios that are difficult or dangerous to replicate in the real world.

Over the years, our simulators have evolved from skill-training simulators, such as basic procedural trainers that allow aircrew to perform simple checklist training, to more realistic simulators that allow skills development. Today, the RSAF uses task-level simulators that allow a number of simulators to be networked, permitting realistic training either with the accurate presentation of threats or large force employment exercises and at the highest level, campaign-level simulators that allow personnel in the Command Post to orchestrate operations at the Air Force level. Moving forward, the capability of mixed live and simulated assets can be fused in the same picture to create a more realistic scenario for training for higher-level exercises, such as at the Command Post-Level. Moreover, there is potential for simulators to be networked with that of other Services, to develop and exercise a networked 3rd Generation SAF.

Figure 7: A trainee pilot undergoing flight training during a 'sortie' on the flight simulator. The simulator's ability to generate complex operational scenarios enhances the pilot trainees' situational awareness and skills in aerial tactics.

CONCLUSION

The RSAF is a competent and established Air Force, but we cannot rest on our laurels and have to continuously develop ourselves. However, this requirement would need to be balanced with Singapore's limited resources. Therefore, as part of our planning policy and discipline, we need to take into careful consideration the available supply, balanced with other national requirements, engage in long term planning and conversation, leverage on technology, innovation as well as the ingenuity and capability of our people to ensure that not only will we overcome our challenges, but we will turn them into opportunities to better ourselves.

ENDNOTES

1. http://www.mindef.gov.sg/imindef/resourcelibrary/cyberpioneer/topics/articles/news/2014/mar/11mar14_news2.html#.VTBsAtK4Xy4
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