

# **POINTER**

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## Editorial

Greetings! I am MAJ Sally Ho, the new Editor, POINTER. It is a great pleasure to come on board the POINTER team and I look forward to bringing you more quality articles and hearing your views.

In this issue, the lead features are a study in contrasts, addressing very different but equally important aspects of the military.

MAJ GEN(Ret) David Ivry, explores the macro-picture and broad trends which are changing the way military force planning is carried out. He finds that the conventional paradigm for force planning is seriously challenged by the increasing demands of limited conflicts due to its fundamentally different operating environment and assumptions. He also points out that although limited conflicts are the dominant form of conflict, most armed forces continue to be guided by the requirements of total war. His article is a thought-provoking and timely piece.

COL Bernard Tan, on the other hand, looks at people and how the Army is putting people first in recognition of the fact that human capital is the most important resource. Interspersed with personal examples that many in the Singapore Armed Forces can easily identify with, he regales readers with the numerous human resource initiatives that the Army has embarked on and goes on to discuss specific points as to how leaders and commanders can play their part in Army Transformation as Career Pacesetters, Community Spinners and Climate Shapers.

Also in this issue are three articles which give an in-depth treatment of the various aspects of airpower. LTC Tan Yuh Cherng, LTC Roland Ng and MAJ Foo Chun Fai address the longstanding question as to whether airpower has altered the strategies of war or merely its tactics. They put forth a strong case for the latter, arguing that new technology and concepts allow airpower to increase its flexibility, pervasiveness, persistence and other key combat functions. They conclude by exploring the issues and challenges of Homeland Security and RSAF transformation.

LTC Lim Kok Siong, CPT Stanley Chua and CPT Teh Hua Fung reaffirm the utility of airpower to Non-Conventional Operations (NCOs), tackling no less than Martin van Creveld himself who asserted that airpower was "obsolete and useless" in most non-conventional scenarios. They examine the concepts and historical application of airpower to NCOs and provide a tantalising preview of the potential applications of unmanned, network and sensor technology for airpower in NCOs.

The implications of Operation Iraqi Freedom (OIF) continue to reverberate around the globe today and the memory of the swift and one-sided nature of the initial phase of that conflict will, doubtless, occupy the minds of military planners and airpower theorists. MAJ Ho Yung Peng and MAJ Teo Cheng Hang's article shows how OIF was not only a showcase for the Revolution in Military Affairs but also reflected the validity of classical military principles. They conclude by trying to draw some lessons for the RSAF while keeping in mind the unique characteristics of the participants and situation.

ASP Devadas Krishnadas from the Singapore Police Force presents a detailed and insightful case study on strategic surprise and intelligence failure based on the Yom Kippur War of 1973. He examines various theoretical models of surprise, the flawed intelligence structures and assumptions that underpinned the Israeli National Intelligence Estimates and the sources of Arab success in achieving surprise and initial operational success against Israel.

We are also pleased to feature two Viewpoints from MAJ Irvin Lim and COL (Ret) Tan Peng Ann on how the SAF can harness the wisdom and experience of its retired personnel. Readers are welcome to pen their thoughts on professional issues to share with the wider defence community through our pages.

Last but not least, you will also find an entry form for the 2004 Chief of Defence Force Essay Competition. Please check our website for more details. We look forward to receiving your entries!

Editor, POINTER

# Developments Affecting Military Force Planning

by MAJ GEN(Ret) David Ivry

National military force planning is a lengthy process, influenced by a series of factors at different levels: the political and economic situation inside and outside the country, the security situation, the budget allocated, technological developments, education, health and a wide variety of social, ethnological and other factors that change over time and may well subvert the decision-making system. It takes a long time to develop primary weapons systems and command, control and intelligence systems. Twenty years ago, it was generally assumed that the lead-time from decision to operational system was 7 - 9 years; today, a figure of 12 - 15 years is more realistic. It should be noted that the longest and most exhausting part of the process is the decision-making, definition and characterization stage.

During this long stage, combat doctrines change to adopt technologies developed by scientists and in accordance with lessons learned from various conflicts and security-related events. These technologies constitute the dominant element in force building and combat doctrine.

We should try to answer the question: "Are we able to predict and guide the way decision-makers will go, or do we just follow after events and explain them in retrospect?"

I will focus on the planning and building of conventional air power, which is a leading element in any security doctrine, especially in those of small countries. The role and composition of air power in the order of battle must be re-evaluated following the end of the Cold War, given the higher probability of limited conflicts and the proliferation of new technologies and threats – tactical ballistic missiles, which are found in the arsenal of seven countries in the region, and weapons of mass destruction, some of which are already operational.

In the past, we tried to assess and analyze the performance capabilities of the next generation aircraft – thrust, maneuverability, rate of climb, energies etc. – in order to prepare a response. But the manned aerial threat has become a secondary effort, while the primary effort has become the ability to destroy high quality targets quickly, at long range, effectively, and at a reasonable cost. In other words, the performance of the weapons systems has become more important than the performance of the airplanes themselves. However, it is also clear that the performance of the aircraft itself is still far from irrelevant.

Air superiority in the conventional sense will remain important in future wars, and achieving it is a vital part of deterrence. But if air superiority is insufficient to prevent the launching of surface-to-surface missiles (SSMs) at population centers, as was the case in Desert Storm, then air power has not achieved its objective – "Clear Skies" – and an alternative response to the threat of SSMs will obviously be sought. Air power is a very expensive component in the overall security basket, and it will lose its place if it does not develop a satisfactory response to this emerging threat. Limited conflicts give air power a chance to demonstrate its effectiveness in an environment in which the risks to forces are minimal. Minimizing casualties is a vital consideration in the political and public environment, because limited conflicts often take on a routine in which air power can demonstrate advantages and achieve results that other forces could achieve only at higher risk.

## Force Planning

In the conventional approach to force planning, intelligence supplies the threat assessment and the planners are those who have to decide on the reference threat. This will serve as the common denominator for all the participants in the force planning process. Each participant in the process, one at a time, assesses its ability to provide a response to the threat, identifies the gaps in its ability and prepares a work plan to close these gaps in the short term, with training and improved combat doctrine, and in the longer term, with procurement and weapons development.

The reference threat is commonly based on a total war scenario that decision-makers believe is reasonable and logical and to which they believe they can provide a reasonable and original response with existing resources. The worst case scenario is usually not chosen since there is no chance to develop a complete response with the means available to the force planner. But the guiding logic has been that the capability to engage in total war also yields the preparedness to confront "limited conflicts" that involve confrontations much smaller in scale than a total war.

In the aftermath of the Cold War, the prevailing sentiment was that limited conflicts rather than total war would henceforth largely mark rivalries between states in conflict. In our region, however, force planning continues to be based on scenarios of total war. Nevertheless, the experience of recent years has been one of numerous limited conflicts, in various shapes and forms. The result is that the training, combat doctrines and weapons are not always relevant to the situation on the ground. This has also happened to other armies that clung to outdated methods and had to rely on improvised special training, rules of engagement, and special weapons adapted to the situation. From conflicts in the Gulf, the Balkans and our region, we have learned that the rules for limited conflicts are completely different from those applied in total war.

### **The Use of Force in Limited Conflicts**

In limited conflicts, there is a serious constraint on the ability of the stronger side to use all its power and capability. The constraint is particularly evident in the case of nuclear weapons – they cannot unleash their nuclear capability in limited conflicts. In practice, the weaker and more provocative side sets the rules, based on the initiatives it takes and the types of weapons it uses. It is assumed that against riots, it is unacceptable to use tanks or fighter planes, and in the vicinity of mosques or churches, the use of power must be constrained, even if the most wanted people are hiding out there. The weaker side uses weapons or tools designed to prevent the stronger side from deploying the full weight of its arsenal, even as it continuously tests the weak spots of the adversary. The challenge for the weaker side will be to find the threshold that the stronger side cannot cross. If the stronger side finds a solution to a certain type of weapon or tactic, the weaker side will try to come up with some other course of action to challenge the stronger side. The weaker side is more flexible in decision-making, does not need to go through a protracted process of political approvals, and can change tactics and policies quickly and flexibly. Thus, it can usually preserve the initiative.

In some cases, however, the weaker side is drawn to cross a threshold with respect to the rules of the game, and this allows the stronger side to act more forcefully than the weaker side anticipated. The constraints on the stronger side's ability to use force derive from the sensitivities of modern societies, especially democracies, the media, casualties and damage to civilians. The concept of avoiding civilian casualties has grown out of proportion since the end of the Cold War. What was acceptable in World War II – to bomb cities and their residents, hospitals and churches – is not acceptable in limited conflicts. The stronger side is not allowed to hit enemy targets in populated areas, especially in cities. And the weaker side finds it easy to exploit this sensitivity.

The sensitivity to casualties and the need, in a democratic society, to justify every casualty in a limited conflict, seriously affect decision-makers and force planning. Thus, the executive branch strongly prefers weapons that imply a lower risk to its own personnel; it will always prefer unmanned aircraft to manned aircraft, space-based intelligence-gathering platforms to human means, and cruise missiles to manned bombers.

The balance between maneuver-ability and firepower, which was so important and sensitive in force planning for total war, is less relevant in limited conflicts, where the stronger side is superior in both maneuver-ability and firepower over its adversaries.

It is true that priority is given to the development of weapons that reduce the risk to personnel, and this implies some preference for precise firepower over maneuverability. But maneuverability is also important, though mostly for special forces and infantry rather than for concentrations of heavy forces, because forces must also be in the right place in limited conflicts. Still, this is different from the maneuverability usually needed in total war.

Tactical intelligence – Targeting intelligence is becoming much more dominant both for maneuverability and firepower. Accurate and timely intelligence can maximize the effect of firepower and reduce the need for maneuverability. Lack of intelligence will increase reliance on maneuverability, which usually increases casualties.

Non-lethal weapons, which were almost irrelevant in total war, can provide a response in certain limited conflict situations. However, non-lethal weapons also have their limitations. They are effective only when deployed without prior warning, and their impact is ephemeral, because the weaker side is flexible and changes its patterns of behavior.

The media in limited conflicts have an important influence on the management of the conflict. It is usually the weaker side that initiates the confrontation, and it can guide itself and the media to benefit its cause. The media generally tends to favor the weaker side, no matter whose side justice is on. Depicting the stronger side as cruel seems more natural and is a simpler message to transmit to the public. And the stronger side reacts by being defensive and tries to justify its actions, whereas the weaker side has the advantage of making pre-emptive claims and not being forced

to provide precise and reliable reporting.

The preliminary conclusion of the analysis thus far is that although we are now involved in limited conflicts where totally different rules apply, our war plans and methodology for force planning continue to be guided by the requirements for total war. This leaves us facing a reality that is not expected or forecasted. It is hard to recommend a rigid and orderly method for force planning for limited conflicts, and it may apply similarly that every country has to adopt a method suitable to its own needs. Developing such a method is not simple but we have to start thinking about how to do it.

### **Total War**

There is no reason to change the method of force planning for total war, and despite the previous analysis regarding the higher probability of limited conflicts, we cannot neglect the need to be prepared for total war. Inadequate preparation or the loss of early warnings can make this option more attractive to others. In short, deterrence capability is vital even if the probability of total war is low. We need to address the various elements that have assumed different dimensions in this context. These elements include the SSM threat, non-conventional weapons, more sophisticated weapons and the problems of operating them and effectively controlling their use, the changes needed to maintain forces and equipment, and political involvement in and access to military decisions in times of war.

### **Changing Norms**

Future wars will be characterized by different emphases than in the past. A number of considerations that will influence the decision-making process is as follows:

- Transparency by the media to the conflict area.
- Sensitivity to the media.
- Sensitivity to casualties and damage to civilians.
- The need for national consensus.
- The need for some form of inter-national support, especially the support of the United States .

Security-related issues will be increasingly influenced by these considerations. It is much easier to decide to launch a cruise missile than to initiate an extensive ground operation.

These sensitivities will push decision-makers to stock up more on unmanned aircraft for a wide variety of aerial missions. Many countries will also try to acquire space-based capabilities, either independently or with the help of others. This impulse will also strengthen trends to develop cheaper, more reliable and more effective systems. These will be offered to consumers as attractive alternatives to manned systems, which will in turn become more expensive because of the required investment in protection and survivability.

In the future, we should expect the development of systems to counter space-based and unmanned aircraft activities. This is how the cycle of development works and it cannot be stopped. We must candidly ask ourselves if we are making a correct and timely decision about the right mix of manned and unmanned systems, and atmospheric and space-based systems. It is true that we are a country without "strategic depth", but above us there are "strategic heights". An expensive example of decision-making that was subsequently discredited can be found in America's decision to procure advanced B-2 bombers. Huge budgets were invested in the development of the aircraft, but in the end, only a few dozens were acquired. At the same time, it was decided that cruise missiles be stock up for conventional missions. Technologically, the B-2 was not a failure. In fact, it was an exceptional aircraft. But the cost became prohibitive, and the alternative of buying cruise missiles was much cheaper and answered the political and public sensitivities we spoke about. The operational demands by the consumers for maximal performance made the price of development and acquisition prohibitive. It has been said, with some irony, that the price of aircraft will be so high in the future that the industries will go bankrupt due to the lack of buyers, and the only

ones to profit will be the analysts who explain why and the convention organizers who discuss it.

The use of unmanned aircraft will force those who develop manned systems to compromise with regards to operational demands. This will lead to a formula, which will allow the presence of essential manned systems within the optimal mix of forces and within reasonable budgetary boundaries.

### **The Sophistication of Weapon**

The weapons we use become more sophisticated from year to year. The potential to extract from them a wide range of capabilities is great. But can the C3 systems supply these outputs? The answer lies in the skills and abilities of the human factor – the systems operators. The logical way to provide these is through appropriate instructional tools and methods. But the main question is whether decision-makers at various levels are aware of current capabilities and whether they will adapt their worldview and past experiences to these capabilities. Decisions in combat situations are taken by commanders and by the political echelon, based on experience, training, and confidence in capabilities; and confidence is the decisive factor. It seems that decision-makers will be forced to make decisions on the use of weapons whose potential capabilities they have no practical knowledge of. Nevertheless, they will have to develop some decision-making procedures and capabilities that go beyond sheer intuition. And the R&D echelon will have to remember that the executive level is an important part of the systems' operating chain. It is important to prepare the presentation and the weapons in ways that will make possible a decision by the executive levels who are not familiar with the minutia of the systems.

### **Standardization**

In large armies, standardization was and continues to be a dominant factor in effective maintenance and management of the forces. It is cost-effective logistically and essential from the point of view of instruction and training. The disadvantages are also clear: updating and upgrading of the systems are done at long intervals, so that the logistical and instructional systems can adapt. As a result, existing capabilities are not exploited to the maximum.

The rigidities of standardization will have to change in order to gain an advantage on the battlefield. Small units with sophisticated weapons that have yet to become standard issue could decide the outcome of battles, and it would be foolish not to use these capabilities before the other side also got them. In limited conflicts, the need for flexible adaptation of equipment to operational needs cannot take the demand for standardization into account, since the weaker side that provokes the confrontation will be dictating the rules of the game. It is apparently necessary to think of a different type of organization of small, independent units with expensive and sophisticated weapons that can exploit their independent capabilities to the full and join the main force on a mission-by-mission basis.

### **Political Involvement**

Greater political constraints than in the past will dictate the character of military operations. For example, military coalitions may be indispensable for the political echelon in order to gain broad international support, even if they make it more difficult for the military echelon to conduct the campaign. Obviously, there are limits on the ability to maximize capabilities, and sometimes the lowest common denominator will be decisive.

The political echelon will be exposed to immediate reactions of the unusual events on the battlefield. The accessibility of the battlefield to the media will oblige the political echelon to respond quickly, and it will therefore have to be informed in real time. In fact, at times, it may even have to be present and involved in battle-management in order to influence the political outcome. After all, the ultimate objective is not just victory in battle, but victory in the political arena.

### **Summary**

In this paper, I have tried to outline the various points which, in my mind, will strongly influence the process of force planning. I do not pretend to deal with the whole spectrum of issues – that would require a much broader outlook. I have therefore not addressed the war on terrorism, protection against and response to threats from weapons of mass destruction, the strategic significance of nuclear weapons in the region, and a range of other topics that should be addressed in any attempt to update the entire security doctrine.

We must not forget that national security goes beyond military capabilities and includes the economy, technology, education, health, social solidarity, leadership, etc.

Yet, my aim in the paper was to highlight several issues that I believe demand particular attention in the process of force planning, to provoke thought, and to encourage one to be more daring in making decisions for needed changes. Because the side that will be a half step ahead of the adversary in technology and the ability to implement it will be the side that wins decisively.

MAJ GEN(Ret) David Ivry is the Founder and Director of The Fisher Institute for Air and Space Strategic Studies. Prior to this, he has held various senior state, defense and military positions in Israel , i.e., Ambassador to the US , Head of National Security Council, Director-General, Ministry of Defense, Deputy Chief of Staff , Israel Defense Forces, and Commander in Chief, Israeli Air Force.

# Putting People First in Our Army

by COL Bernard Tan

## The Exceptional NSF

Spectators of the 2003 NDP 03 had come away somewhat bedazzled by the fireworks. They were delighted by the giant PIGI projections on the stadium floor. The costumes were most delicious to the eyes. The costumes were the joint vision of the Artistic Director, Mr Glen Goei, and the Costume Designer, Mr Hayden Ng. More significantly, they were also the result of the managerial skills of one NSF 3SG Wong Tien Loong.

3SG Wong Tien Loong was the Costume Co-ordinator for the Show Segment of the Parade. He had put in late hours and burnt weekends, at his own volition and with minimal supervision; his only concern was the beauty of the end. He was professional, resourceful and diligent. In fact, he would have been poached for NDP 04, were he not ORDing before the event.

A rare and exceptional NSF indeed, one who is unlikely to say ORD loh! But tell his friends, Hey, if my ORD were later, I could have done another NDP.

Are exceptional NSFs that rare? Are they exceptions rather than the norm? How can one get more of such people? How does one get more out of people?

## Putting People First

People are the key to capability. Human capital is the most important resource. The slogan has been shouted from the mountain tops but has the good word spread to the slopes and valleys yet? Are people being taken personally and seriously? Have we allowed ourselves to prioritise people?

The slogan is everywhere to be seen in the SAF. The Air Force Vision: First Class Air Force. World Class People. The Navy have their People Developer Standard. In the Army we say, Our Army, the Decisive Force (emphases added).

## General Staff Sets The Pace

I believe we mean what we say. Starting with only two battalions in the 60s, the SAF's energies up till the 80s were directed at building hardware.

In the 90s, the Army began setting the pace by strengthening our organisation's software, our people's heartware.

In 1994, the Care For Soldiers campaign brought the emphasis back onto one of the seven SAF core values: to treat our soldiers as our very own. A value that commanders were sworn to up-hold.

In 1995, G1-Army shifted our paradigm for BMT, from a Breaking Down philosophy to Building Up approach.

In 1998, the New Partnership for the Officer Corps, the WOSE Corps, and the DXOs, took a fresh look at fundamental relationships, both tangible and psychological, that have been too long taken for granted.

The New Partnership continues to be relevant today. It stands as a commitment to the continuous review and renewal of relationships, in Pay and Benefits, Performance Management, Career Management, Career Transition, Work Environment, and Recruitment and Retention.

In 2000, the Learning Organisation, (LO) movement, was launched, to increase our people's capacity for new capabilities and competencies. The Army's senior leadership experienced first-hand the potential of Organisational Learning tools and framework. These tools focused on developing leaders for learning, or training the trainers – they are the software for the people's software.

In 2001, the National Service Affairs Department (NSAD) was created to look into NS affairs, to bring greater awareness of NS issues and definitive action to the wider SAF community.

In 2003, NSAD gave us a clear framework for ground initiatives, to create a positive and meaningful NS experience. There are five key thrusts to this framework: Leadership, Effective and Efficient Training, Touch Points, Belief and Sense of Purpose, and Cohesion. Together, they provide a doctrine for the NS experience that is applicable not only to NSFs and NSmen but to regulars as well. A common language for past, ongoing and future ground initiatives.

Our people need inspired Leadership. The Note from the Chief of Army (COA): Leading Our Soldiers Well, has outlined 10 key aspects of leadership for our reflection. Leaders elicit greatness from others.

Our people need Effective and Efficient Training. NSmen want to look forward to in-camp training. NSFs want to look forward to booking in. They want to feel better, not bitter, from the experience.

Currently, there are still many Touch Points that hold back the positive NS experience. 3rd Guards were on Protection of Installation duty for the second time in two months this year. Poor working conditions and boredom were identified as the major negative touch points the first time round. Working together with 2PDF, the CO, LTC Tay Boon Khai, ameliorated the conditions by allowing his men to wear sunglasses on duty, bring in radios, even coca-cola. There was a marked improvement in experience, without compromising operational performance.

Our people need Purpose. Purpose gives passion. CTF 2 deployed in theatre in Timor Leste in March 2003. Comd 3 SIB visited them in June 2003, and on three more occasions thereafter. COL Ong Yu Lin brought them promotion letters, did medals presentation, went from POB to POB; he interviewed the men, from signallers to storemen, from transport specs to troopers. He showed the men video messages from their loved ones in Singapore, and brought back their video replies to their families and friends. Comd 3 SIB, and the many other commanders who visited our frontline troops, represented the Army's heart and the Army's touch. Our troopers were powerfully reminded of what they were fighting for; they received a renewed sense of purpose and passion to do their duty.

Our people need Cohesive Teams. Cohesion is the moral component of fighting power. When Comd 8 SAB was CO 40 SAR, he felt that the Battalion motto Victory Unto Victory was rather abstract. He invented the war cry, Warriors of 40 SAR – One Family, One Spirit, To Be One. Cohesion programmes were put in place to cultivate this sense of being united, of being one. It was not about results. But the strength in unity produced results: 40 SAR was best combat unit for WY 01 / 02. In LTC Benedict's own words, Focus on the intangibles to achieve the tangibles.

We have seen that creating a positive and meaningful NS experience is not just about solving problems: they are also about positive action, creating lifelong memories and turning points in life. COA has given us the language: Defining Moments. Defining Moments turn the Army from organisation to culture, from employer to family.

Three weeks before ATEC, Comd 596 SIR was to brief the Battalion core group on Prep ATEC. Having already done a similar brief, the CO, MAJ (NS) Ismail told COL Ishak, and these were his words, "If you insist, we can go through the motion again."

COL Ishak converted the briefing to a dialogue session on What success in ATEC meant to NSmen, and in particular, the NSmen of 596. The NSmen themselves, not the Comd, kept it going for four hours. They had moved on from learning How to learning Why.

The Battalion went on to achieve High REDCON 2A in ATEC and to become the best NS Battalion for ATEC in the last work year. The NSmen themselves requested for a thorough AAR three weeks after the ATEC.

The Comd had transformed what was a potentially negative Touch Point into a positive one. Some NSmen love to say, Same shit, different day. It took a confident leadership to cut that shit for the NSmen of 596. It made training more effective and efficient. They were given a renewed sense of Purpose. They achieved Cohesion. The NSmen of 596 had a Defining Moment.

How often do our commanders invest intellectual effort to plan and create opportunities for our people to experience Defining Moments?

## **Where Do We Go From Here?**

Change is upon everyone: a saying that should never, and will never, become a cliché. COA has thrown down the gauntlet, Find the order in change.

We've heard the vocabulary for change; we have the words, Putting People First. But do we have the grammar?

What does it mean, when asked to put people first? People are complex. The people resource has enormous potential, but it is also enormously difficult to unleash that potential.

General Johannes von Seeckt, Chief of Staff for the German First Army and then the Eleventh Army during the First World War, has said, with unimpeachable authority:

Every man of action is an artist, and he must know the material with which, in which and against which he works before he begins his task. Man is the most difficult – the most recalcitrant and the most grateful, the most faithful and the most treacherous of all materials.

Allow this article to give a simple proposition: Putting people first means putting what's important to them first.

People are not a cost to the organisation, to be summarily defrayed. They are not even a resource, passively awaiting discovery and development. People are human capital. We have to actively and accurately invest in people, embed in them the right values, help them gain value, create for them the meaningful stretch.

The New Partnership has given us powerful language for the renewal of relationships with our regular servicemen. The Learning Organisation movement continues to articulate and sustain our drive towards excellence. NSAD has given us the doctrine for renewing the relationship with NSFs and NSmen. In the coming year, NSAD will continue the good work in helping to transform the NS experience.

## **Commanders Walk The Talk**

The time is now, for commanders on the ground to walk the talk, to build on the good work done so far and go for a People-First culture that will strengthen the core of the Army Transformation. There are three things people want, the three Cs that build culture: Career, Community, and Climate.

### **Career Pacesetters**

Career is important to people. More relevantly, our people are concerned with how the Army's transformation will affect their careers. Is it known, what is on their mind? What is their mindset on change?

Some may be in denial. They want life-long jobs. They want stable progress. They want jobs to stay the same. They want to learn something at the start, and not have to learn any more. Tell them to learn something new, they may get their NSFs to learn it for them instead.

Some are genuine concerns. Will they lose their Division family? Will their ranking be affected?

Others are sceptical. Is transformation just another fad? Is it merely lip-stick on the bulldog? The Ministry of the NEW thing?

### **Can mindsets be changed?**

The power of a mindset is undeniable but the power to change it is even more invaluable.

We would have continued to "Break-Down" recruits in BMT if we had not realised the superior effectiveness of Building them Up instead.

Fixation on Performance alone will yield diminishing returns if we cannot accept that Learning and Experience will

actually yield increased performance.

New forms of warfare emerge in the Army ' s transformation, correspondingly new forms of peacefare will be required. Commanders need to lead this new peacefare.

Commanders must become Career Pacesetters. They have an onus to connect people mind to mind, to get our people to see the big picture, understand the need to change. They must have the moral courage to break mindsets when necessary and to challenge their minds: our people must be made to see.

We don't want career laggards. We want more than just stayers; we want people to stay relevant. Our regular servicemen must understand, although employment is not secured, it is our value that will be secured: that is the assurance. The promise of the new age is not about new things, but about the renewal of old values.

The capacity to accept value-addition is the key. Trapped in a wrong mindset, even when given the chance to enhance their value, people will spurn the chance; they will reject value. Given the right mindset, people will recognise value and seek it out for themselves.

Leaders must get their people to take personal responsibility, to accept new things and, to prepare themselves for an uncertain future. We can give people the sea to swim in, but we cannot accept it if they insist on staying in the bowl. They must learn to jump out of it! In times of change, it is understandable that people are cautious. But at some point, we need the moral courage to move on. The Army needs to move on.

Challenging minds is necessary, but not sufficient. We need to capture hearts, to coach people heart to heart and, to listen to their concerns – we need to discuss what is in it for them, how they will be measured and, how we can help them get there. The time, the training and skill set development we can work out with them to increase their value for the future.

You put people first when you challenge their minds. You put people first when they know that you care.

Let us get into specifics.

How well do we know our people? Do we know what make them say, stay and strive? Do we give them a reason to join, a reason to stay, a reason to give?

How often do we counsel our people or provide job performance feedback in a year?

Do we give constant feedback? Do we encourage constant feedback? Is honest feedback without consequence?

Is alignment of worker to work a key performance indicator? Do we have systemic induction programs to integrate newcomers into old jobs, and realign old-timers to new jobs?

What about NSFs? Do we see their two years as a career, or a liability? Are interview booklets a way to know your men better, or things to do before PATS inspection?

What about NSmen? While we expect them to put on uniforms, defend our way of life, fight for our birthright, are we equally concerned about how they are doing in their work place, how they are doing with their families?

Commanding Officer, Officer Personnel Centre once had a regular officer who was at the cross-roads of his career. Too much camouflage, too much sweat, too many nights and, too many mosquitoes, too little time and, too many un-predictable times. Not enough time for his girlfriend. The crossroad was before him: should he commit to the long haul with the SAF? Should he venture out?

LTC Nelson Yau set him a challenge. He did a mid-career review with him, gave him career feedback, facilitated career discovery, and explored career options. The officer has since chosen to stay, and found a new lease of life in his career. He saw the bigger picture. Today he is happily married and happy with his work. He feels rejuvenated by the timely change – he is, in his own words, Ready to Chiong.

We too, must become Career Pacesetters. We have the responsibility to coach our people; we have a duty to hold their interests at heart. Mentor our people, pass on vision and values. Help our people Lift the lid on their lives, help them grow, and help them reach their potential, and be all that they can be.

An old adage: Give a man a fish, and he'll eat for a day. Teach a man to fish, and he'll eat for a lifetime.

Now, teach a man to love the sea, and he'll teach his children and grandchildren to love what he loves; and they'll build boats, they'll build ships, they'll build a mighty commerce of the sea.

### **Community Spinners**

Community is important to people. One fisherman alone on the river, he works only to feed himself and, no more; he has after all no greater reason. A community of fishermen: together, they're a river of life. There is a bigger picture.

Work involves other people: it involves their advice, their resources, their friendship; it involves their reluctance, their deceit, and their hostility!

In her book, *Leadership and the New Science: Discovering Order in a Chaotic World*, M. J. Wheatley has found that Power in an organisation is the capacity generated by relationships. It is energy that comes into existence through relationships.

Commanders must become Community Spinners. Together with the Guards Formation psychologist, LTC(Dr) Lim Beng Chong (then MAJ(Dr) Lim) from ABSD, surveys were carried out to map out relationships in 7 SIB. LTC(Dr) Lim terms this as Social Network Analysis.

When you're in a place long enough, you get a sense who talks to whom, who likes whom, and who has lunch with whom. In 7 SIB, the Log WOSEs will check in with each other over lunch everyday, same time, same table in the cookhouse. The Comd PA lunches with the Finance Officer, the HQ Chief Clerk, and the BMO would drive them in his car. The S1 Branch clerks rarely take lunch with the clerks from other branches. Incidental observations like these accrete over time to form a fairly reliable mental map of the work environment.

With Social Network Analysis, this tacit mental map is documented. The exercise begins with surveys done by a selected group. Three questions were asked in the 7 SIB exercise: 1) Who do you go to for work-related advice ; 2) Who do you go to for non-work-related advice ; and 3) Who do you find difficult to work with. A custom-made charting and mapping programme is used to convert this data into a network map. The collated answers to different questions will produce a differently shaped network.

The results are kept confidential; only the participants themselves will know where they stand. There are immediate practical applications. With the results, LTC(Dr) Lim will counsel each of the survey participants individually, to help them achieve better alignment in the work environment. It is of great pertinence, to know where your PSOs are, and where your key appointment holders stand. If each KAH may be associated with a primary function (or cluster of functions), then the network could also give a pretty good picture of the hierarchy of priorities in the work environment.

Given an idealised end-state, actions like counselling, or even tactical intervention, could be taken, using the map of existing network as a guide. If nodes are on the outside, indicating estrangement, how can they move, or be moved, inwards, and form more linkages? If at the centre and well-linked, what responsibility do they have to mentor, to exert good influence, and to effect change?

The following figure gives a representation of a desired social network. It visually represents the desired outcome of the Guards' Closely Knitted Family, or Armour's The Force, The Family, or 6 Div's Cobra Experience.

Family, I think, is the final estimation of worth. No matter how much the world changes, there is still family. No matter how much the Army transforms, it is still Our Army.

The silkworm spins threads that are, weight for weight, four times stronger than steel. As Community Spinners, we have to spin strong bonds between soldiers that bind everyone into one Family. A soldier by himself, he may fight, no more. But if a soldier has a family here, if he includes in his family more than just his buddies, if he includes also

his platoon, his company, his Battalion, his Formation, he is committed to the bigger picture. He will fight.

### **Climate Shapers**

There is a branch in 7 SIB where the men keep a mood chart for their boss. A green sticker for a good mood, a yellow sticker for Alert Amber, and a red sticker for Alert Red. Very terrible, the day there is a red sticker.

Recently an impromptu debate was conducted between teams of NSFs during a National Education session with all the companies in 7 SIB. They were given the debate topics, 1) That We Should Not Give Our Best During NS, and 2) That We Cannot Have A Positive NS Experience.

The responses were very rowdy, and very stimulating. The debate sent a clear message: That there cannot be a positive NS experience unless NSFs and NSmen are given an environment where they are willing and allowed to give their best. Being powerless is their greatest obstacle to excellence. Feeling useless is their greatest impediment.

Climate is important to people. Is where you work a great place to work? The organisational climate is the ambience, the mood, the buzz, the prevailing ideology that is shaped by the actions or inaction of one's immediate leaders. It is the actions and inactions of leaders that generate either feelings of value or valuelessness.

ABSD has done the research, and has delivered the behavioural model, that NS contribution is linked to perceived value: the more valuable they perceive themselves to be, the more truly valuable they become.

As leaders, we have to take action to help our people find their value. We must work with NSAD to create the climate that will transform the NS experience. But there is more we can do. We must be Climate Shapers.

In this age of change, we must dare to shape a climate of reconfigurability. Leaders must possess the discretion and willingness to pluck out people from their customary duties, shift them around, transfer power, redesign their work, realign them to cope with the erratic availability of resources to achieve our desired outcomes.

Coming back to the NDP 03 example, can we produce more Tien Loongs this way? Tien Loong is a returned PSC Scholar, Masters in Engineering. However, I do not accept that education is necessarily a guarantee of value. The trick, perhaps, is not to create more Tien Loongs, but to ensure that different NSFs and NSmen are as well aligned to different organisational needs as Tien Loong was to his responsibilities.

There was no time for him to do another NDP, but there was time for him to co-ordinate the publication of the commemorative book for the Guards' Silver Jubilee, Force of Choice. There was time for him to help plan a major exercise, as the AS3.

When one's abilities are tuned to the task, the ideology is clear: Everyone has a part to play.

CO 1 Guards, LTC Perry Lim, was very keen on National Education, but there was no clear structure within the Battalion to promulgate it. So he plucked willing NSFs from their companies, gave them clear rules and guidance, empowered them to make decisions. Finding themselves in this environment, this group of NSFs delivered a one-year NE workplan, Heart, Mind and Soul.

CPT(NS) Lim Siang Dat, the BEO for 7 SIB, had thought he would go through the same old shit in the Brigade exercise. When it was discovered that he was an IT consultant, he was pulled into the Brigade Tactical HQ, and involved in the Brigade's experiment to achieve better command and control of forces in operations. Maybe it was professional pride, doing something he was good at, or maybe just excited to be doing something new, the BEO effectively became a second Dy S3; he became the fusion agent of the Brigade TacHub. Furthermore, one week after the exercise, he delivered a consultant report on the Brigade experiment, at market standard and free of charge!

Comd 2 SIB did not get Tien Loong for NDP 04, but he had his own CPL(NS) Ong Kwang Hui. Kwang Hui was an NSF in 4 SIR. He specialised in Mass Communications. LTC Chan Wing Kai plucked him out to manage the multi-media team, under which creative settings Kwang Hui greatly upped his contributive quotient. He proposed five designs that went on to become the basis for this year's NDP branding designs. His work will be seen everywhere, on banners, on Zocards, on tickets, on posters, on adverts, and most importantly, on everyone's minds .

This particular benefit of having a citizen army is one we do not appreciate enough. There are already talents among us, hidden like seeds in a field. And like a field, if there's too much sun or too much rain, talents won't grow. As Climate Shapers, we must create a climate for high performance, learning and experience. As Climate Shapers, we must create a great place to work, so as to bring out the best in our people.

## **Conclusion**

People are like water: if we can't get more from outside, we'll make our own. The point is, we have to remake people, we have to remake ourselves; we have to give ourselves the power to re-make and re-create, or suffer obsolescence.

As Career Pacesetters, we are mentors and coaches to our soldiers. We are their guide to changing their mindset to face the change to come. As Community Spinners, we spin strong bonds, strengthen the core, and build communities. As Climate Shapers, we create defining moments, shape a positive working environment, shape a climate that maximise our worth, that make people feel worthwhile.

Will we get more Tien Loongs? Will we get more Kwang Huis? It all depends on whether we put our people first!

## **GLOSSARY OF TERMS (IN ORDER OF APPEARANCE)**

**NDP** National Day Parade

**PIGI** Automated rotating double scroller projector designed by ETC Audiovisuel in France

**NSF** Full-time National Serviceman

**3SG** Third Sergeant

**ORD** Operationally Ready Date to signify the end of Full-time National Service

**SAF** Singapore Armed Forces

**G1** Personnel & Administration Staff at Brigade and Division

**WOSE** Warrant Officers, Specialists, and Enlistees

**DXO** Defence Executive Officer, previously termed NUSAF

**LO** Learning Organisation

**NSAD** National Service Affairs Department

**COA** Chief of Army

**2PDF** 2nd People's Defence Force

**CTF** Company Task Force

**POB** Patrol Observation Base

**SIB** Singapore Infantry Brigade

**SIR** Singapore Infantry Regiment

**SAR** Singapore Armour Regiment

**ATEC** Army Training Evaluation Centre

**REDCON** Readiness Condition

**AAR** After-Action Review

**BMT** Basic Military Training

**OPC** Officer Personnel Centre

**Chiong** Hokkien. Refers to highly motivated performance. Literal meaning: Charge

**ABSD** Applied Behavioural Science Department

**PA** Personal Assistant

**BMO** Brigade Medical Officer

**PSO** Principal Staff Officer

**KAH** Key Appointment Holder

**PSC** Public Service Commission

**AS3** Acting S3 (Operations)

**NE** National Education

**BEO** Brigade Engineering Officer

**Dy S3** Deputy S3 (Operations)

**Zocards** Brand of postcard-based advertising

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# Transformation of Airpower

by LTC Tan Yuh Cherng, LTC Roland Ng & MAJ Foo Chun Fai

Airpower is the ability to project power or influence through the medium of the air to achieve strategic, operational or tactical objectives. For nearly a century, there has been a fundamental difference of opinion as to whether or not airpower has altered the strategies of war or merely its tactics. If it is the former, airpower can be seen as a revolutionary leap in the conduct of war but if the latter is true, then airpower is simply another weapon that joins the arsenal along with the rifle, artillery and the frigate.

Such a debate has not been fully resolved. But the recent body of evidence in Afghanistan and Kosovo adds to the theory that airpower has indeed brought about a revolution in war, because it has altered virtually all aspects of how it is fought, by whom, against who and with what weapons. Operation Iraqi Freedom reinforced the notion that modern air forces, properly employed, can quickly and dramatically transform the operational situation by stripping the enemy of its air defences, dismantling key elements of national infrastructure and isolating, immobilising and attriting field forces.

Much of this revolution in warfare can be explained by airpower's unique characteristics of ubiquity, speed, range, potency and flexibility. However, traditionalists maintain that airpower's inherent limitations of impermanence and its inability to hold ground continue to place insurmountable boundaries on airpower's ability to truly transform warfighting. With the advent of high endurance unmanned systems, long range precision weapons, high assurance datalinks, high speed C4I systems and more powerful ISR systems, such a proposition may no longer hold true.

It is thus important for us to examine how technological advances have affected the nature of airpower as this issue has a direct impact on how the RSAF, and concomitantly the SAF, should go about transforming our-selves. The approach this paper has adopted to do is an eclectic one. It first examines the unique physical attributes of airpower that we have commonly associated with manned aircraft and highlight how emerging technologies can alleviate airpower's traditional weaknesses and enhance its strengths. The synthesis will show that modern technology can further enhance airpower's unique attributes, mitigate its traditional limitations and truly influence the conduct of warfare in fundamental ways. Riding on these findings, the paper will then endeavour to put forth some suggestions on how the RSAF can go about actualising such a transformation insofar as technology, concepts, people and organisation.

## **Airpower As A Dominant Source of Military Power – Enduring or Ebbing?**

One can arguably trace aerial warfare back to the 1700s with the advent of balloons and suggestions to use them to reconnoitre enemy positions and potentially bomb them. But it was the epic heavier-than-air machine flight by the Wright Brothers in 1903, which marked the first concrete step of technological advances for airpower's evolution into a mature element of modern warfare.

Since then, in tandem with enabling technological advances, airpower has evolved from being a peripheral component of military force to what General Omar Bradley described in 1956:

“Airpower has become predominant... both as a deterrent to war, and in the eventuality of war, as the devastating force to destroy an enemy's potential and fatally undermining his will to wage war.”<sup>1</sup>

Early air theorists have advocated strategic bombing as the concept to fully exploit the military value of air-power. However, in recent times, many have come to believe that the advent of high rate, around-the-clock capability to precisely spot and strike fielded enemy forces either on the move or in defensive positions, as demonstrated in Kosovo, Afghanistan and Persian Gulf campaigns, is portending a new phase in the history of air warfare.

## **Airpower's Unique Physical Attributes**

What are the unique characteristics of airpower that accounted for its amazing ascent in the last 100 years even as its dominant form of application changes with time and context? Glimpsing into the future, what are the new factors that may re-define air- power in fundamental ways? This topic can be discussed and argued in many ways. One simple but insightful perspective is perhaps to examine the issues in terms of the premium physical attributes of

airpower, commonly agreed to be speed, range, elevation, lethality and flexibility. 2

Military aviation systems, the traditional means of airpower, are valued for their long range, high speed and power of elevation to serve as carriers of a versatile range of payloads for diverse types of missions, such as reconnaissance, transportation, communications, or ground attacks. In this sense, "command of the air" battles are wrestles for the right to take military advantage of the medium of air – air superiority is a means to higher ends. Looking back, even the flimsy planes of 1918 could fly several hundred miles at one hundred miles per hour. And they overcome with ease natural and man-made obstacles to surface forces, such as hills, rivers, forests and build-up areas. Today, many modern aircraft are capable of unrefuelled ranges of thousands of miles at speeds of several hundreds miles per hour. This makes military aviation systems sometimes the only means to reach key enemy facility or capability, simultaneously if needed, across the entire depth and breadth of an enemy country. In fact, airpower's flexibility is often acknowledged in terms of its ability to enable the parallel conduct of different types of air campaigns at the same level of war, as well as at different levels of war.

Across the spectrum of air missions, virtually all the air theorists have given great focus on the issues of ground strike. At the extreme, some may argue that a history of air strategy is a history of the search for the single, perfect target. In the era of unguided or "dumb" weapons with limited range, military aviation systems provide both the necessary extended range to reach targets in depth, as well as the precision through aiming sights during weapons launch.

For the latter, by the 1991 Gulf War, with increasingly accurate bombing platforms equipped with increasingly advanced sighting systems, a circular error probable (CEP) of 160 feet is attainable for medium altitude "dumb" bombing. While this is probably the physical limit of accuracy achievable by "smart" systems with dumb bombs 3, the close to 20-fold improvement since War World II 4 has significantly cut down, though not completely eliminated, the requirements for redundant targeting. Coupled with the attributes of speed, range and elevation, concentrated firepower can be directed at specific locations on and behind the battle area, further enhancing the lethality of modern airpower. This is particularly effective for large targets, such as industrial plants, key transport systems and nodes, enemy vehicle parks, and fielded enemy forces not yet engaged by own forces.

### **New Airpower Equation**

The framing above describes the traditional competitive advantages of airpower commonly associated with the manned aircraft, especially the high performance and "smart" systems, for which military planners are willing to pay a premium to possess. But the advent of information and network systems, modern air / surface delivered stand-off, precision-guided surface attack weapons 5, as well as unmanned aerial systems have radically changed this calculus, and defined a new airpower equation. At the conceptual level, the terms "Network-centric Warfare", "Precision Warfare" and "Unmanned Warfare", which gained popularity after Desert Storm, are indications that this is not just about new technologies or better gadgets but maybe the emergence of new form of warfare that will fundamentally change the way airpower is constituted and employed. In the case of the SAF, the evolving concept of Integrated Knowledge-based Command and Control is our attempt to frame the possibilities for warfare in the Information Age.

To illustrate some of the possible ramifications of the new factors to airpower, consider the simple case of a flight of aircraft on a ground strike mission. Precision weapons with accuracy usually measured in feet have reduced the need to hedge against the probability of a miss. Even at the dawn of the modern precision weapon era, four flights of laser-guided bomb (LGB) armed McDonnell F-4 Phantoms perfunctorily took down the Thanh Hoa bridge in North Vietnam on 13 May 1972, which massive numbers of planes and dumb bombs in the previous seven years had failed to significantly damage. 6 Precision weapons have changed the notion of mass for ground attack from the air. Instead of sorties per target, planners can now talk in terms of targets per sortie. This trend will be further boosted by the advent of increasingly smaller warheads and weapons, as precision and miniaturisation enter a mutually reinforcing spiral.

But the above argument is equally valid for surface-launched precision weapons, which increasingly will have comparable range, speed and accuracy, and becoming a key element in the new airpower equation. This means that strike missions in the future are increasingly likely to be conducted by an integrated force comprising air and surface elements rather than huge formations of aircraft. The key question will be: Which option is the most cost-effective for the effects to achieve? In the case of special targets or groups of targets that require heavy payload, the scale will tilt more towards aviation systems that have natural advantage in capacity. But eventually, each military force would have to find its own optimal balance depending on its unique strategic context and operational requirements.

A follow-on point is that precision weapons become themselves a justification and means to acquire more cost-effective precision-weapon carrying aviation platforms. Not every platform needs to be both a “designator” and “shooter” . With advanced networks and networking, the demand for the “shooter” to provide Precise Aim has reduced. Precision Guidance and Precise Control of the weapon itself have allowed target designation and engagement updates to be provided from sources other than its carrier. 7 For example, “double lasing” is a common technique for Laser-Guided Bombs (LGB) employment.

Notwithstanding the concepts of employment, organisational structure and processes, the prosecution of Precision Warfare will require capable intelligence, sensor, and network systems. Furthermore, the necessary information and network systems to support the employment of precision weapons will also provide force-multiplying effect for flight. While better information does not allow the aircraft to fly faster, longer or higher, it can provide better awareness for the aircraft to take the least dangerous or defended route. This in turn may mean the need for less aircraft to perform protection role. Better information can also give flexibility in the form of on-the-fly reassignment of higher priority targets. The possibilities are endless with information and knowledge.

It is worthwhile to point out that the relation between aviation and information and communications / network systems can be symbiotic. The advantage of elevation is obvious for the function of sensing. But in the Information Age, elevation confers an advantage. Advanced networks usually have a high demand for bandwidth. In the commercial world, 3G mobile phones today are already offering throughput of 384Kbps to 2Mbps. This would require carrier frequency beyond VHF band, which in turn require the communicating nodes to be within line-of-sight. Air platforms, with its inherent physical advantage in elevation, are in a good position to surmount this challenge and become key hubs not only for sensing and targeting but also in the overall military network system.

Unmanned aerial systems provide the means to lessen the natural limitation of conventional airpower – impermanence. Unlike surface forces, pilots cannot live in their medium and have to land in order to rest, refuel and rearm. The value of unmanned aerial systems lies in their endurance – they are able to stay in the air over a longer duration, and generally at lower cost. Persistence – the ability to have continuous presence in time – can be achieved with planning to conduct strike, sensing, networking and other functions.

With these new factors in the airpower equation come the issues of orchestration. What will be the right mix of systems for a transformed airpower? How should manned and unmanned systems be integrated to give airpower unprecedented flexibility, pervasiveness and persistence for sensing, networking, targeting, effects evaluating and other key combat functions? What are the unique force multiplicative effects that airpower can provide in joint, land, sea and information campaigns with its combat advantages conferred by the new factors in airpower equation? What should be the underlying infrastructure, linkages and processes for Command and Control, and information flow to bring everything together? Although the SAF has some pieces of the puzzles, we recognize that there is still much to explore.

In summary, this section only examines the possible ramifications to airpower by new factors in the equation from the physical attribute perspective. Other perspectives, such as political considerations and concept of deterrence, will provide equally interesting insights on the possible future path for airpower. This will require a longer analysis than what this article intends to discuss. But what is clear is that there are complex issues in force structure and technological developments, strategy and doctrine, command and control structure and processes, as well as education and training that need to be examined and resolved to fully harness the potentials and possibilities for warfare in The Information Age.

### **Technology, Concepts, People**

While the metamorphosis of a caterpillar into the glorious butterfly requires it to remain in a cocoon, it will be quite unlikely that RSAF can afford such luxury. As the RSAF moves on to embrace the transformation for the next quantum leap, there are three pillars: Concepts, Technology, and People that The Pillars for Transformation have to come together for the complete transmutation. Tomorrow’s military capabilities will depend on the right investment in enabling technologies that can be integrated into new or existing systems and employed using new operational concepts, and more importantly, by people who are properly trained and willing to embrace the new concepts. Short of the proper doctrines and correctly skilled war fighters, the newest machines will not generate the airpower that allows it to continue its dominant role in future battles. In this article, some suggestions are discussed on the many facets the transformational journey that RSAF can take.

- Technology

New concepts of warfare have proliferated throughout military jargon after Desert Storm which the US forces won decisively. How can airpower continue to maintain its relevance and effectiveness in the future battlefield, with these new sources of military power?

The delivery of a weapon is only the end-point of a process involving a complex array of inputs and information that enable it to arrive at the right place, at the right time. Some key technological areas that will enable dominance in the battlefield will be precision strike capability, information networks and unmanned platforms.

While these technologies are not uniquely applied to the utilization of airpower, they, however, uniquely provide the edge for airpower to further its dominance in the battlefield.

One key weakness of airpower is its impermanence. Currently with large unmanned aircraft, like the Global Hawk, 24-hour coverage of the battlefield can already be achieved. With the eventual advent of unmanned strike platforms, not only will there be round-the-clock intelligence, surveillance and reconnaissance (ISR) coverage of the battlefield, the enemy will not have breathing space between pauses in air strikes encountered today.

With intelligence gathered from unmanned aircraft supplementing those from various sensors (surface-based, electro-magnetic sources, space-based, etc) dispersed over the battlefield, an integrated information system can provide a collated picture of the battlefield. This global picture will enable each warfighter to gather information that is critical to his / her mission. Coupled with the existing speed, range and elevation advantage of air assets, strategic strikes at the enemy as well as having the ability to divert to targets of opportunities can be carried out in a persistent manner.

Certainly, the question will be whether such capabilities can be realised through cost-effective means, given limited budget? It may be possible that highly valued platforms may not be the way to go. They may likely be bought in relatively small numbers in view of limited budget. What may be a possible alternative is to have miniaturised technology to keep versatility high, but with size and cost per platform remaining low. With the expected advent of photonics (for example, optical switchers and fibres) and Micro-Electro-Mechanical-Systems (MEMS), sensors and platforms based on current technology can be miniaturised while performing the same missions, if not more. How about deploying dozens of small or even micro- UAVs be packed with light-weight, modular payloads for surveillance?

The emerging opportunities with the fusion of technologies in MEMS and the possible use of “ smart material ” will benefit manned aircraft, which also give rise to new hybrid weapons systems. With manned aircraft, it may be possible for each to be armed with small and precision-strike capable munitions that can be software-controlled and tuned to fulfil different missions. Such platforms can pick out and execute “ target-of-opportunity ” missions broadcast over the air. Some examples of new hybrid weapons systems are surface-launched cruise missiles with the capability to loiter and strike at the most appropriate time, and morphing UAVs that can change their “ shapes ” to optimise their performance for different missions. These possibilities certainly offer new areas that airpower can tap into, and to extend its pervasiveness (in both time and space) in future battlefields.

With unmanned systems, the operator no longer resides in the platform. The human management and command and control (C2) paradigms may have to be changed. For airspace management, the maturity of sense and avoid technology is crucial for safe inter-operation with both manned and unmanned platforms. System technologies that focus on the man-machine interface hopefully can be developed with new understanding in human cognition. With the expected increase in information flow and data exchange over the “ air ”, wide-band communication networks will have to be developed. This is an area that the military can leverage on the commercial leaps in communication technology.

- Concepts

The effective use of technologies will have to be complemented by its proper deployment. During World War II, the French certainly had no less tanks than the Germans. The lopsided victory of the Germans in the battle best illustrated the right use of tactics. In order for the RSAF to maintain itself as a modern airforce, transformational concepts and appropriate deployment will be what are needed for RSAF to propel itself to greater heights. The following are possibilities raised in the form of questions to generate more discourse rather than prescriptions.

## **Providing Homeland Air Security.**

Currently, dedicated air defence fighters provide the first line of air defence for Singapore . Dedicating assets for specific roles may, however, sub-optimize the use of our assets. In this case, if air threats are not imminent, then these dedicated air defence fighters would have been under-utilised.

In time to come, with precision munitions getting smaller, aircraft will have room available for more payload, be it air-to-air or air-to-ground ordnance. This offers fresh possibilities in force employment. For example, fighters with Air-to-Air AMRAAMs and miniaturised PGMs can simultaneously take up the role of intercepting and killing enemy attackers, as well as to perform strikes, such as targeting and destroying time-critical and sensitive targets. The traditional delineation of Air Defence fighters, sweepers and strikers will increasingly be blurred.

Potentially, our fighters can be truly swing-role, seamlessly transitioning between air defence, sweep and strike missions. Coupled with increasingly capable surface-based air defence systems that can reach further targets and are more lethal against the full spectrum of air threats, the traditional notion of a multi-layer air defence concept can have a very different face.

Indeed, it is pertinent now that we should relook at the entire concept of Homeland Air Security because a large scale force-on-force struggle for survival cannot be the only impetus for Homeland Air Security in this new milieu. With the end of the Cold War, there have been more regional conflicts and now terrorism threatens many nations across the world. Homeland Air Security must thus factor in these new geopolitical circumstances.

As high vigilance is required at all times, we will need to expand our thinking on how best we can provide for our Homeland Air Security. Specifically, we will need to see how best a robust and sustainable air defence shield can be put up for long periods of time without incurring attendant costs so exorbitant that we fall into the asymmetry trap. In this respect, long-range ground-based air defences coupled with a small complement of fighters and Non-Cooperative Target Recognition radars may offer an efficient peacetime air defence against the constant and amorphous threats from the air.

Of course, there will be many challenges in implementing such revolutionary changes in our force employment concepts, but we need to start testing these ideas.

**Achieving Air Dominance.** Moving on to the control of the air, there are interesting issues for us to address. In the past, control of the air meant the decisive application of airpower against installations or infrastructure used by hostile forces. With the destruction of the installations or infrastructure, the generation of hostile airpower can be stopped. This would allow us to achieve air dominance. The means by which firepower is delivered has, for most airforces, been the aircraft. Looking forward, technology may be able to provide cost-effective alternatives in the form of surface-launched precision-strike missiles. That would radically alter the air dominance equation in two ways. First, application of fires on installations or infrastructure can be done using a more diversified set of strike means. Where the balance lies, however, will remain something for us to examine. Second, if airpower can be applied through a variety of means, achieving air dominance will be more than the destruction of installations and infrastructure. The ability to target elusive missile launchers and ship-based missile launchers will increasingly be part of the air dominance campaign.

**Dominating from the Air.** We will need to be able to dominate the land and sea environments in order to ensure air dominance, even as air dominance creates the conditions for us to dominate from the air. The endurance limitation of manned platforms meant that airpower is generally applied in heavy pulses. In the case of most airforces, strike cycles are planned at a rate of one major offensive about every few hours. This means that in between strikes, the enemy can potentially reconstitute and reorganise.

However, UAVs, with their high endurance, allow us to overcome the transient nature of airpower. The recent applications of unmanned warfare in Kosovo , Afghanistan and Iraq provide ample evidence for this. With their persistence, unmanned systems carrying good sensor payloads have the unique ability to paint the battlespace continuously. Coupled with on-demand air strikes, UAVs allow us to apply force in a timely and precise manner. The result is one where the enemy faces certain destruction each time he moves. Such persistence denies the enemy any opportunity to reconstitute.

In so doing, the psychological refuge that comes with even a fleeting respite from air strikes can be removed. This

can be demoralising to any ground soldier or naval combatant; that the mere presence of unmanned systems could cause the collapse of their morale and cohesion. Today, the SAF is looking at how persistent airpower can be used to shape the ground and naval wars decisively. Together with our Army and Navy, the Air Force can apply timely and precise fires to dominate the land and sea battles.

Such a capability is revolutionary in war and can also contribute significantly in peacetime. Take the example of the peacetime requirement of maintaining a recognised sea situation picture, where high sea traffic volumes combine with wide swathes of water to make such a requirement particularly demanding. High endurance UAVs would be able to mitigate these demands because they are able to translate their height advantage and leverage on advanced sensors to provide over-watch over huge areas. The speed and endurance of these UAVs also mean that every UAV sortie can be used to cover multiple maritime zones in a flexible and sustainable manner. The advantages of the UAV over ships and other sea-borne vessels are only too obvious.

Given these systems, UAVs will have a bigger role in the Air Force and airpower's perennial problems of impermanence and transience are mitigated. Together with the manned fighters' flexibility and efficacy in bringing heavy loads to bear swiftly, UAVs will bring complementary capabilities that will allow us to push the airpower envelope to new frontiers.

- People

New technologies and concepts offer new opportunities. But to exploit them will require a transformation in our organisational design and people. Ultimately, it is the people who can harness and exploit technology in revolutionary ways that will make the critical difference. The challenge for the organisation is how to create an ecosystem that will be conducive to unleash the innovative minds of our people. While the exact "how" for the creation of this kind of ecosystem in a military organisation is still a topic of intense debates, it is generally agreed that openness, spirit of experimentation and intelligent risk-taking are the attributes that the organisation should encourage and consciously reward when there are visible, even if not huge, achievements.

Operationally, the transformation journey ahead is going to be filled with new ideas that may at first look like the dichotomy with traditional notions of how we do things. For example, with the advent of more capable computing, communicating and networking technologies, many arguments were centred on whether there should be greater centralisation or decentralisation in the function of Command and Control. It is useful to clarify the merits of each model in different specific context. But the more important point is to be cognisant of the dangers of falling into the mental traps to think of available options in terms of either "1" or "0". Instead of hard-wiring the systems based on a particular model, the real opportunities today lies in the potential to create systems that are truly flexible and adaptive to prevailing conditions and requirements. Adaptiveness through continuous learning will truly be a premium competitive advantage for the organisation, especially at a time when many agree that the only certainty about the future is uncertainty.

## Conclusions

To end, it may be interesting to highlight an analogy that Chief Defence Scientist, Prof Lui Pao Chuen, has used at various international and local forums to describe the challenges that the SAF is facing today:

Unlike the SAF in the past whose main focus is dealing with hot war, the strategic context today demands the SAF to be both a sprinter and marathon runner – the former to fight short, high intensity operations and the latter to sustain long, low intensity conflicts. Over-optimisation of one will be at the detriment of the other. This not only applies at the strategic design level but also at the capability structuring level.

The story of the German Luftwaffe's fighter aircraft design, for example, the Messerschmitt Bf-109 and Junkers 87 "Stuka", during WWII is illustrative of what could happen if our suite of capabilities is locked in to handle a narrow operational context. While highly optimised and successful for Blitzkrieg operations, the limited range of the German fighter aircraft eventually became a liability at the Battle of Britain, as they could not stay over the battle area for very long before having to return home. The rest, as most people would say, is history.

Therefore, as the SAF explores the unknown in this journey of transformation, we must remain open and flexible to create options for plausible scenarios, experiment to surface relevant questions and solutions, and reserve capacity to deal with the uncertainty.

## Endnotes

1 General Ronald R. Fogleman, Chief of Staff, United States Air Force, "Strategic Vision and Core Competencies", as delivered at the Air Force Association Symposium, Los Angeles, CA, 18 Oct 1996.

2 Colonel Phillip S. Meilinger, USAF, "Ten Propositions Regarding Air Power", Air & Space Power Chronicles, 1995.

3 Lessons from the Gulf War indicated several problems with medium and high-altitude bombing with unguided munitions, even with digital "smart platforms". First, the visual bombing pipper was two milli-radians wide. At a slant range of 20,000 feet, typical for high-angle dive deliveries, the pipper blanked out an area on the ground 40 feet across, often hiding the target. To the resulting errors must be added bomb dispersion errors. For example, the Mk 84 General Purpose bomb dispersion was 5-6 milli-radians. The result of both of these kinds of errors was a worst-case 160-foot missed distance, even if the pilot did everything right and the system worked perfectly. Richard P. Hallion, Precision Guided Munitions and the New Era of Warfare, Air Power Studies Centre, APSC Paper Number 53, 1995. He calculated from data that by the time of the Gulf War, the capabilities of 'smart' airplanes dropping dumb bombs from medium altitudes were sufficient to place an unguided munition within 160 feet of a target.

4 Richard P. Hallion has examined the case of trying to hit, with a hit probability of 90 per cent, a target measuring 60 x 100 feet using 2,000 pound unguided bombs dropped from medium altitude:

War Number of Number of CEP Bombs Aircraft (in feet)

World War II 9,070 3,024 3,300

Korea 1,100 550 1,000

Vietnam 176 44 400

5 Precision-guided aerial munitions (PGM) in general refer to self-propelled aerial projectiles, guided in flight toward a target either by remote control or by internal mechanisms. The weapons can be launched from air or surface platforms, and vary widely in size and type, ranging from large strategic ballistic missiles with nuclear warheads to air-to-air missiles for air superiority battles to small, portable anti-tank weapons carried by foot soldiers. Although most are military weapons with explosive warheads, others may carry scientific instruments for gathering information within or above the earth's atmosphere. Ground attack PGMs in this article refers to a particular class of PGMs, including air-launched variants – laser-guided bombs (LGB), satellite-guided bombs (e.g. Joint Direct Attack Munition (JDAM)), air-launched cruise missiles, ground attack missiles (e.g. AGM-65 Maverick, Joint Stand-off Weapon (JSOW), and Joint Air to Surface Stand-off Missile (JASSM)) and ground-based systems, such as the US Army's Tactical Missile System (ATACM) and surface-launched cruise missiles. "US Missiles" Federation of American Scientists. ( 10 Nov 2000).

6 McPeak, Merrill. "Precision Strike—The Impact of the Battle Space." Military Technology (May 2000): pp20-24.

7 Precision engagement will depend on three factors – precise aim, precise guidance and precise control. Precise aim depends on pre-launch target data update and orientation of the shooter. The common precise guidance can be from laser homing, inertial, optical or infrared imaging, or satellite signals from the Global Positioning System (GPS). Precise controls are normally realised through adjustable fins, and sometimes self-propulsion of the weapon.

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# Airpower In Non-Conventional Operations

by LTC Lim Kok Siong, CPT Stanley Chua & CPT Teh Hua Fung

Global security underwent a paradigm shift in the late 20th and early 21st centuries. In the 1990s, the collapse of the Soviet Union, dismantling of the Warsaw Pact, and the subsequent end of the Cold War, triggered a re-orientation of military focus from conventional wars to non-conventional operations. Military forces were employed increasingly for missions related to peacekeeping, evacuation, humanitarian aid and Low-Intensity Conflicts (LICs). In the late 1990s, following a series of terrorist attacks on US facilities throughout the world, "A National Security Strategy for a New Century" identified transnational terrorism as a key concern for the US in the Year 2000 and beyond. 1 Indeed, T3 soon took its place at the top of the US Armed Forces' agenda in the wake of the terrorist attacks of September 11. Against this backdrop of a new security paradigm, capabilities of armed forces throughout the world were fundamentally re-assessed.

The notion of LIC has been in existence as a political-military concept even before the US emerged as the sole superpower in the world. However, with the end of the Cold War, the mounting spectrum of operations conducted at medium-intensity levels led to the introduction of the US-coined term "Operations-Other-Than-War" (OOTW). 2 Yet, even in its land of origin, the concept of OOTW has remained fuzzy. It has been inconsistently defined by documents that originate from the Joint Chiefs of Staff, the Department of Defense and the US Army field manuals respectively. 3 Indeed, the loose use of terminology is evident in the way that OOTW has been variously described as a form of LIC, asymmetric conflict, peace enforcement operation and small war. Rather than haggle over the academic nuances in these descriptions, this article will adopt the term "Non-Conventional Operations" (NCOs) to describe an array of operations undertaken in relation to peacekeeping, peace enforcement, counter-insurgency, non-combatant evacuation, humanitarian assistance, relief and counter-terrorism.

Besides conceptual formulation, the utility of adapting conventional military capabilities for non-conventional employment has similarly been a matter of disagreement. In particular, the relevance of airpower in the spectrum of non-conventional conflicts has been disputed amongst politicians, military theorists and military practitioners alike. For instance, the role of airpower has been dismissed by military theorists such as Martin van Creveld, who wrote:

"In a world where almost all wars are fought not between states, but within them, many if not most of [airpower's] elements have become obsolete and useless." 4

Indeed, with the majority of problems in non-conventional conflicts being rooted in ethnicity, philosophy and politics – issues that airpower and high-technology traditionally have little relation to 5 – the scepticism over airpower is not inconceivable.

This article will challenge the view that airpower is irrelevant to NCOs. Instead, it will be argued that the increasing employment of airpower for NCOs throughout the world attests to the necessity for airpower as an indispensable component of non-conventional missions. For example, airpower was extensively used in the US campaigns in Grenada, Oman, Bosnia, Afghanistan and Iraq; the Israeli operations in Libya; and the Russian efforts in Chechnya and Afghanistan. In the RSAF context, the recent transformation in the regional security landscape has similarly led to an increased reliance on airpower for non-conventional ends, such as Humanitarian Assistance Disaster Relief (HADR) missions, Non-combatant Evacuation Operations (NEO), Peace Support Operations (PSO) and Counter-Terrorist Operations (CTO). By examining how other militaries have harnessed the unique capabilities of airpower in NCOs, and the potential ways of enhancing the application of airpower in light of recent technological developments, this article will seek to demonstrate that the role of airpower in NCOs is a critical and irreplaceable one.

## Capabilities of Airpower in Non-Conventional Operations

Airpower has been called upon to be the "lead element" in the employment of the "Military Instrument of Power" 6 in NCOs. The qualities that it offers, such as dominant manoeuvre and precision engagement, are unique and devastating not only in conventional missions but in non-conventional ones as well. 7 The ability of airpower to bring about disproportionate advantages compared to land or sea elements of warfare renders it an indispensable component to be leveraged upon to meet the ever-changing spectrum of NCOs. In this section, the vital combat and

support capabilities of Air Power in NCOs will be examined respectively.

- Combat Capabilities

The employment of airpower in combat roles rides on capabilities such as Wide-Area Surveillance, Precision Engagement and Pervasive Operations. In CTO, Wide-Area Surveillance enables military forces to deal with terrorist networks consisting of loosely connected cells that are relatively organic and independent in their operations. It complements the intelligence picture and reinforces surveillance and reconnaissance capabilities. Security planners are thereby equipped with the necessary means to overcome the challenges of intelligence-gathering, as well as, the locating and monitoring of the activities of terrorist cells and members.

In the context of peacekeeping, the ability of airpower to provide Wide-Area Surveillance is similarly critical, as such in an environment that usually consists of a small number of ground forces with no recognisable frontlines and little separation between belligerent formations and the surrounding civil population. Airborne sensors, besides being non-intrusive, can also relay information efficiently, which is vital both for political decision-making and battlefield awareness. For instance, as early as 1975, peacekeepers in Sinai exploited the capabilities of aerial surveillance and satellite reconnaissance to create a system, which allowed them to monitor ceasefire compliance with great success. <sup>8</sup> Thus, by relying on an integrated network of airborne sensors such as synthetic aperture radars, thermal infrared line scanners and electro-optical sensors <sup>9</sup>, airpower offers an unparalleled means to survey and maintain real-time intelligence over a large area.

In view that mass firepower is not a politically feasible option in most NCOs, the ability of airpower to undertake Precision Engagement assumes paramount importance. In a climate where collateral damage is of increasing concern to democratic governments, the ability of fighters and attack helicopters to deliver weapons in a responsive and precise manner allows the achievement of military objectives without compromising political ideals. This was clearly shown in the well-documented effects of laser-guided bombs in the recent Gulf conflict. In the case of CTO, given that terrorists are able to blend in easily with the civilian populace, Precision Engagement is similarly necessary to counter the latter's elusiveness. As such, the ability of airpower to conduct all weather, day or night surgical strikes on small and mobile targets at short notice renders airpower an essential instrument in the conduct of NCOs.

The third capability of airpower in the combat role – that of Pervasiveness – stems from the speed with which airborne platforms can traverse the air-space, which allows them to reach and inflict damage on targets that are miles apart. Pervasiveness can be fully exploited in NCOs (in particular, CTOs) as the associated perpetrators are usually equipped with only limited counter-air capabilities. In turn, airpower's ability to conduct pervasive operations is complemented by its flexibility, a capability granted by the increasingly multi-role nature of today's air platforms, which provides greater latitude for the switching of roles whilst airborne. Together, pervasiveness and flexibility enable operations against time-critical targets to be conducted in an efficient and effective manner. For instance, it was reported that during the Russian campaign in Chechnya, a Russian A-50 (AWACS), upon detecting the rebel president Dudayev talking on his cellular phone, relayed his position to an airborne Su-27, which diverted from its original flight plan and took him out with a precise TV-guided bomb. <sup>10</sup> In this light, the Pervasiveness of airpower infuses a lethal and instant quality like no other.

- Support Capabilities

While the combat employment of airpower for NCOs is of relatively recent origin, the support roles of airpower in NCOs are far better established. Airpower's contributions in the aspects of Mobility and Versatility are the key factors that enable support roles to be undertaken with resounding success. The aerial mobility afforded by fixed- and rotary-wing transport platforms offers a myriad of transportation options that can be tailored to suit a variety of roles, ranging from ferrying of personnel, to evacuation and Search-and-Rescue (SAR). In addition, mass strategic airlift capabilities increase the timeliness of deploying peacekeepers, which enables friendly forces to quickly attain local superiority through troop concentration. For example, in 1993, strategic airlift capabilities allowed the UN to move thousands of US, European and Russian troops to Bosnia within days of a peace agreement. <sup>11</sup> At the same time, air mobility is also crucial in facilitating the expedient delivery of supplies, such as food and medicine, to forward-deployed ground troops or friendly non-combatants in a PSO scenario. In the case of troops whose movements are restricted due to geographical or geopolitical obstacles, the reliance on airpower, in effect, provides sustenance in the absence of a land-based supply line. Indeed, according to Harry Summers, "thousands [in Bosnia] are alive today because of the dedication of US and allied airlifters." <sup>12</sup> On this account, airpower is necessary to ensure that personnel and logistics supplies will enjoy freedom of movement between areas of vastly

disparate geography.

In a similar vein, the Versatility of airpower has been well utilised particularly in less benign situations, mission survivability and continuation of operations, which are often contingent upon the adaptability of the resources at hand. Helicopters, for instance, became an icon of the Vietnam War due to the plethora of roles they played: not only did they provide troops with the element of manoeuvre, they also provided timely support fires in CAS missions, and dedicated SAR support for downed aircrew and foot soldiers. 13 The UH-1H, AH-1 Cobra and HH-3E “Jolly Green Giant” have since gone down in history as powerful symbols of the war. In addition, the versatility of airpower is also reflected by the sheer range of capabilities that airpower offers, which includes those offered by reinforcement assets, such as tanker aircraft. In Operation Allied Force in Serbia, over 355,800,000 pounds of fuel 14 were transferred, allowing combat aircraft the persistence to relentlessly strike ground targets. Indeed, Lieutenant General Michael Short, US Joint Forces Air Component Commander, was sufficiently impressed by the success of such assets as to conclude that “without tankers, we could not have fought this war”. 15

The combat and support capabilities of airpower are fundamental to the conduct of NCOs. While traditionally employed for conventional wars, experiences of other militaries in NCOs have produced consistent and convincing evidence that airpower cannot be left out in the conduct of a non-conventional mission. In relation to the RSAF, airpower has been used extensively to provide support for ground operations. For instance, UH-1Hs were deployed to Timor Leste to support the peace operations, while on various occasions, C130s, Fokker-50s and KC-135s have also been used for evacuation, medical and relief missions. In particular is our recent deployment of a C-130 and KC-135 to the Persian Gulf to aid in the rebuilding of post-war Iraq as part of Singapore’s continuing contribution to the multi-national efforts. This clearly shows that as a member of the international community, we will need to be able to undertake NCOs in concert with other friendly forces. Even on a daily basis, airpower is employed in the form of Maritime Air Surveillance, enhancing our security against non-conventional threats such as maritime terrorism and piracy. Finally, our ability to conduct Pervasive operations is crucial for counter-terrorism both in the air and maritime domains. The speed at which airpower can react to a potential terrorist act significantly reduces the possibility of a successful attack. In this light, there is considerable scope for airpower to be further exploited. In addition, technological advancements in recent decades will provide yet further ways of enhancing the applications of airpower for NCOs. This will be examined in the next section.

## **Technological Advancement and Airpower Applications**

Over the years, technological advancements in the aerospace industry have not only improved the efficiency and effectiveness of airpower, but have also created new areas of applications for airpower. The key developing capabilities that are particularly important in reinforcing the role of airpower in NCOs include unmanned technology, network technology and sensor technology. These will be described in turn.

### **Unmanned Technology**

The advent of unmanned technology has further enhanced the capabilities of airpower in the realms of intelligence-acquisition and area surveillance. In the domain of intelligence-acquisition, Unmanned Airborne Vehicles (UAVs) are ideal for conducting battle damage assessment and acquiring signals and imagery intelligence. Their capacity to loiter for extended periods of time provides the sustained real-time intelligence needed to make accurate decisions in an unpredictable and fluid environment. This was evident during Operation Enduring Freedom (OEF), where UAVs beamed high resolution video imagery to the satellites orbiting overhead for subsequent transmission to command and control nodes, equipping commanders with superior situational awareness. 16

In the area of surveillance, the relatively lower costs and longer endurance of the UAV makes it an affordable platform for wide-area surveillance purposes. Being “essential to realising all important persistent surveillance of the battlespace” 17, UAVs are an imperative for NCOs, given that close monitoring and provision of real-time updates on the movements and activities of insurgents are essential to the success of such operations. In this light, the use of UAVs may be hindered by issues related to airspace management and concerns about their concurrent deployment alongside manned platforms. These issues, once overcome, will open the doors for the tapping of the potential utility of unmanned technology in NCOs.

Future developments in unmanned technology hold even more exciting prospects. The intelligence acquisition capability of UAVs will be enhanced in the future with larger payloads, which allow UAVs to carry more complex sensors that can provide better image resolution even at a greater stand-off. New kinds of payloads, such as customised Electronic Warfare suites, 18 are also becoming UAV-compatible, which means that increasingly, an

array of dissimilar sensors can be carried to perform a variety of tasks in a single mission. In turn, developments in Miniature UAVs (MAVs), such as the Israeli-made Spy, Birdy and Mosquito 19, will serve to provide CT forces with a tactical “over-the-hill” or “round-the corner” surveillance capability that is employable with minimal risk to human life. Indeed, some of these machines, being no larger than a credit card, may be as elusive as the terrorists themselves.

Finally, with the recent equipping of UAVs with munitions, the future Combat UAVs (UCAVs), will be a perfect weapon for high-risk operations. The effectiveness of UCAVs was validated by the successful deployment of the Predator as an unmanned shooter during OEF, where it was armed with Hellfire missiles and tasked to track and strike elusive targets over Afghanistan’s unfamiliar terrain. Coupled with persistence as well as developments in Foliage Penetration (FOPEN) sensors, it will not be long before UCAVs turn into the dominant force for fighting LIC in forested areas and to conduct maritime patrol anti-piracy operations. The sheer pace of these developments in unmanned technology will serve to amplify the importance of airpower in NCOs even further.

### **Network Technology**

Advances in network technology will provide quantum improvements in the effectiveness of airpower for time-critical missions. By connecting C2, sensing and shooting elements, network systems shorten the sensor-shooter cycle, giving rise to the responsiveness that is necessary to achieve the successful engagement of time-critical targets. In particular, these developments will significantly enhance the ability of airpower to deal with terrorist elements that are difficult to locate, identify and isolate, as they tend to operate in areas with thick vegetation, villages and urban structures. The advent of network systems will ensure that once detected, these elements can be tracked continuously, and their positions relayed and updated to the shooters accordingly. At the tactical level, recent developments in network technology have also enabled situational awareness to be shared between dissimilar aerial combat or support platforms. For instance, Boeing, in 2003, demonstrated an internet-like connection between a 737 C2 aircraft and an F-15E1 Advanced Technology Demonstrator. This enabled aircrew from both platforms to share images and intelligence in a real-time manner, allowing them to respond to a simulated threat by re-planning a mission during flight. 20 Indeed, as network systems become faster and more reliable, the time-criticality feature that they afford will immensely enhance the role of airpower in NCOs.

One of the key areas of development in network technology is that of satellite communications – both military and commercial. John Stenbit, US Assistant Secretary of Defense for C3I during OEF, has said bluntly that the US forces would not have been able to disseminate UAV sensory data without commercial satellite links. 21 As satellite systems become more accessible and cheaper to operate, they can be relied upon, more than ever before, to be the over-arching communications backbone to achieve an enhanced decision-making cycle in NCOs. In turn, given that a considerable span of NCOs is undertaken by multilateral forces, the wide coverage provided by satellites will also allow situational awareness of the various participants, as well as their central commands, to be levelled up efficiently. Indeed, Brigadier General Dennis C. Moran, CENTCOM’s director of C3I systems in OEF, has even gone so far as to describe the campaign as a “war being fought on IP services”. 22 While the comment may be far fetched, it nonetheless holds true that the proliferation of satellite technologies will go a long way in reinforcing the capabilities of airpower in NCOs.

### **Sensor Technology**

Finally, technological advancements in sensor technology will further augment the sensing duties that are predominantly undertaken by airpower. Advancements in sensor technology will assist in overcoming the current problems associated with the isolation and recognition of small or low signature non-conventional targets. Meanwhile, experiments are also underway to develop radars that are able to see through walls, which will be useful in determining if particular rooms within buildings are occupied – an important capability of urban NCOs. In addition, the advent of technologies in Foliage Penetration, Synthetic Aperture Radars and Moving Target Indication (MTI) sensors, hold prospects that in the foreseeable future, airborne platforms may be equipped with the ability to track moving targets behind vegetation, denying hostile elements any possible hideouts in forested areas. Taking the issue of resolution even further, multi-spectral and hyper-spectral sensors will render it possible to remotely examine phenomena across the entire electro-magnetic spectrum. Operators will now be able to classify potential targets with much greater fidelity due to the unique spectral returns from each one. 23 In view of the sheer range of possibilities afforded by the latest sensor technologies, using them in NCOs to complement the employment of airpower seems only a matter of time.

In the context of the RSAF, efforts are currently underway to examine the potential applications of developments in unmanned, network and sensor technology. In the domain of unmanned technology, UAVs are poised to take over

selected roles from manned platforms, thereby optimising our pilot and aircraft assets for other taskings. Indeed, the use of UAVs in the recent operation to locate the three gunmen in Pulau Tekong provided a glimpse of the role that unmanned platforms could potentially play in NCOs. In turn, the current thrusts in the SAF towards IKC2, network-centricity and data-link will serve to reinforce our capabilities in NCOs, particularly for the engagement of elusive and time-critical targets. Further, satellite systems, if exploited, can enhance situational awareness and decision-making by our top leadership in relation to the peace operations that are being undertaken in other countries. Finally, sensor technology that allows the penetration of walls and foliage will be invaluable for the conduct of CTOs. Within our shores, such capabilities are especially critical due to our heavily urbanised and densely vegetated landscape. In consideration that the RSAF will continue to be involved in the conduct of NCOs in the foreseeable future, it is imperative that these emerging technologies are leveraged upon to reinforce our capabilities in the non-conventional realm.

### **Observations of Airpower Applications in Non-Conventional Operation**

The state of troubled peace will continue to affect most countries in the foreseeable future. The scale of NCOs being undertaken by militaries is similarly likely to remain, if not increase. In the last two decades, the effectiveness and roles of airpower in NCOs have generated much interest and debate. For example, the issues of whether air-power could “do it alone”, and the critical difference that airpower could deliver, were keenly debated during the Gulf Wars. On the one hand, vivid images of PGMs being guided through bunker windows provoked military planners and international intelligentsia to think about precision strike and airpower as a future alternative to ground troops. On the other hand, the world was shocked when September 11 occurred. It seemed as though airpower was impotent against T3. Against this conceptual backdrop, the present section will seek to elucidate on the various issues that have since transpired.

Following the first Gulf War, conclusions from the study of Operations Desert Shield, Desert Storm and Desert Sabre lent much weight to the argument that airpower was instrumental to the success of the Joint Campaign. Although dominant and decisive during the early stages of operations, airpower – alone – is unlikely to satisfy the overall political aim. 24 Notwithstanding the fact that air forces did deliver their promise to make any ground offensive a walkover 25 in the Gulf War, there were also instances in which airpower did not deliver its intended results. Indeed, based on the lessons learnt from operations in Haiti, Somalia, Rwanda, Cambodia, the former Yugoslavia and Bosnia, there is consistent evidence that the effectiveness of airpower must be taken in the context of its overall employment. To this end, it is increasingly being accepted that joint and / or combined operations organised under a Task Force structure that is suited to the operational scenario and objectives, have proven in NCOs to be the way of the future.

It will be a mistake, however, to conclude from these observations that airpower will therefore play a marginalised role in future NCOs. Indeed, the potential applications of airpower, as outlined in the earlier section, will further increase the efficacy of the Task Force. Technological advancements have allowed airpower to move beyond its traditional boundaries in the areas of airlift, logistics support and occasional area bombing, to combat roles pertaining to intelligence-acquisition, surveillance and strike. Centralised C2 in air operations also provides airpower with an un-paralleled ability to condense Boyd’s Observe, Orient, Decide and Act (OODA) loop, at both the tactical and operational levels. In addition, even though airpower cannot “do it alone”, it plays a critical role in bringing about a faster resolution of conflict, reducing the loss of life and lowering material costs. For instance, it has been observed that peace support operations in Cambodia, Somalia and Bosnia could have been longer, and more lives would have been lost, if not for the scale of air operations conducted. 26 In these conflicts, the presence of air support allowed UN ground forces to accomplish their tasks without being constrained by local factions or obstacles. It enabled the delivery of humanitarian aid and disaster relief to sustain recovery operations and provided a psychological value that was leveraged upon to coerce the non-cooperative leaderships to bring about negotiation and capitulation. In Kosovo, for instance, conflict resolution was achieved almost entirely through airpower. It should be noted, however, that in a situation where the players have an amorphous organisational structure, airpower would cease to be as effective in shortening or bringing about conflict resolution. For instance, Israel’s air operations, such as the Grapes of Wrath against the Hizbullah, did not bring about a resolution. On this account, a moderated stance is perhaps the most feasible conclusion: while airpower will continue to play a critical role in NCOs, its employment will need to be pursued in conjunction with mutually reinforcing elements.

Secondly, unlike in conventional operations, the demand for precision strike is far more exacting where non-conventional target sets are concerned. The following excerpt, extracted from RAND’s Project Air Force study, succinctly captures two key inherent problems with employing air assets to strike targets in NCOs:

“Specifically, improvements are called for in the capabilities of U.S. air forces to identify, and attack very small groups of people with appropriate levels of confidence that the right target is being attacked and that innocent

civilians will not be placed at undue risk.” 27

Operationally, this translates into two imperatives for the aircrew: the first pertains to the ability to ensure that the right target is acquired and accurately designated, while the second pertains to the issue of weapons selection. Being able to tell two target buildings apart may be good enough for most conventional strike missions, but identifying target individuals amongst other civilians, or differentiating one man from another, is a different challenge. In addition, the munitions used must not inflict collateral damage due to blast and fragmentation effects upon impact. Notwithstanding the technological advancements described earlier, it remains difficult for today's Precision-Guided Missiles (PGMs) to achieve the same kind of accuracy that a 5.56mm calibre round provides. Furthermore, environmental and other external factors can cause PGMs to deviate from their designated flight path. In this regard, given the limiting factor of weapons effects, it is necessary to qualify that the role of airpower against non-conventional targets is not without its limitations.

Finally, in view that the “war on terror” is likely to be protracted, a new trend has surfaced that will present significant challenges to the developments in airpower's capabilities. While airpower is traditionally built to deliver a swift and decisive punch, faced with an elusive threat that is adept at surprise attacks, the challenge today is to forge a defence force that is able to stay on guard at all times. Endurance has become a key requirement amongst other airpower qualities such as flexibility, pervasiveness, speed and mobility. Indeed, if one equates the conventional airpower capabilities to a sprinter, the present security paradigm calls for selective components of airpower to be a marathon runner. Against the terrorist threat, an enduring intelligence, surveillance and reconnaissance capability, as well as a high-value asset protection capability, are crucial, due to the need to respond to the threat faster than the time required by the threat to attack. Coupled with the ability to concentrate firepower, it is possible, then, that an entirely new synergistic capability to deal with terrorist activities may be realised. 28 To this end, the operations conducted by the Israeli Air Force over Lebanon in 1994 have effectively demonstrated such a capability. In light of the war against terror, it is therefore necessary that the capabilities of airpower be as enduring as they are lethal.

## **Conclusion**

The security challenges in the post-Cold War and post-September 11 era have generated far-reaching changes in the applications of military power. Closer to home, the roles of the SAF in NCOs have witnessed a steady increase in complexity over the years, with operations graduating from the missions in HADR, NEO and PSO, to combat support missions in OIF and defence operations in CTO. For the RSAF, the global trend of increasing airpower employment in NCOs, the unique capabilities of airpower, as well as the enhancements to airpower brought about by technological advancements, serve to provide avenues in which our assets can be employed in NCOs. However, the concurrent challenge is to balance our conventional readiness against the demands of sustaining readiness for NCOs. Unlike other air forces, the RSAF is organised and equipped to meet peacetime operational demands and readiness training. The consequence is a possible mismatch of capacity that can result in potential ops development or training trade-offs if the available resources remain status quo, while the growing trends in non-conventional commitments, including protection against terrorist threats, continue. These issues will need to be addressed as the RSAF takes on a wider array of NCOs.

Giulio Douhet once said, “I have mathematical certainty that the future will confirm my assertion that aerial warfare will be the most important element in future wars.” In light of the increasing operations that are conducted in the non-conventional realm, as well as the critical and irreplaceable role of airpower in NCOs, Douhet's prediction may be right after all.

## **Endnotes**

- 1 Robert S Barr, “Can ‘Air Power ’ Counter the Asymmetric Threat? Factors Influencing the Employment of Air Power against International Terrorist Threats ”. Air Command and Staff College, Air University, 2001.
- 2 E.A. Stepanova, “Military Operations Other Than War: The US View ”, Military Thought, March-April 2002.
- 3 E.A. Stepanova, “Military Operations Other Than War: The US View ”, Military Thought, March-April 2002.
- 4 Martin van Creveld, “The Rise and Fall of Air Power ”. The Quarterly Journal of Military History 8, no. 3, Spring 1996, 81.

- 5 Brooks L. Bash, "Air Power and Peace-keeping "Air Power Journal, Spring 1995.
- 6 Robert S Barr, "Can 'Air Power ' Counter the Asymmetric Threat? Factors Influencing the Employment of Air Power against International Terrorist Threats ", Air University, Air Command and Staff College, 2001.
- 7 Ibid.
- 8 S.B. Fleming, Organizational and Military Impacts of High Tech Surveillance and Detection Systems for UN Peacekeeping ", Operational Readiness and Evaluation Project Report no PR535, Department of National Defense Canada, (Dec 1992).
- 9 Michael Krepon and Jeffery P. Tracey, " 'Open Skies ' and UN Peacekeeping ", Survival 32, no. 3, (May-Jun 1990).
- 10 Timothy L. Thomas, "Air Operations in Low Intensity Conflict, The Case of Chechnya ", Aerospace Power Journal , (Winter 1997).
- 11 Brooks L. Bash, "Air Power and Peace-keeping ": Air Power Journal, (Spring 1995).
- 12 Harry S. Summers, "A Date to remember: Actions, Decisions Pull World to Bosnia ", Air Force Times, no. 38, 26 Apr 1993.
- 13 The HH-3E Jolly Green Giant was the primary SAR platform for the USAF during the Vietnam War.
- 14 Lt Col D. Richard Simpson, "Command of Theater Air Mobility Forces During the Air War Over Serbia: A New Standard or A New Data Point? ", Air and Space Power Chronicles, (2000).
- 15 Simpson.
- 16 Robert K. Ackerman, "Operation Enduring Freedom Redefines Warfare ", The Fight for Freedom – A Signal Magazine Tribute, AFCEA, (Sep 2002).
- 17 "Defense Science Board Study on Unmanned Aerial Vehicles and Uninhabited Aerial Combat Vehicles ", US Department of Defense, (Feb 2004).
- 18 Anthony Finn, Kim Brown, Tony Lindsay, "Miniature UAV 's and Future Electronic Warfare ", EW & Radar Division, DSTO, produced for the Land Warfare Conference, Brisbane, Australia, (22-24 October 2002).
- 19 BBC News, ( 26 Mar 2004).
- 20 Boeing News Release, 9 Jan 2003, [http://www.boeing.com/news/releases/2003/q1/nr\\_030109m.html](http://www.boeing.com/news/releases/2003/q1/nr_030109m.html)
- 21 Ackerman, 2002.
- 22 Ackerman, 2002.
- 23 Ochmanek, 22.
- 24 John Teager, Blessed Be The Peacemakers – Conflict, Peace and Air Power, Air Power Studies Centre, Canberra, 1996, p91.
- 25 Gordon, M.R. and Trainor, Gen B.E.. The Generals 'War, Little , Brown & Company, Boston, 1995, p474.
- 26 John Teager, Blessed Be The Peacemakers – Conflict, Peace and Air Power, Air Power Studies Centre, Canberra, 1996, p104.
- 27 Ian O. Lesser et al., Countering The New Terrorism, RAND Project Air Force, 1999.
- 28 Gordon, Shmuel L., The Vulture and The Snake Counter-Guerrilla Air Warfare: The War in Southern Lebanon, Begin-Sadat Center for Strategic Studies, Bar-Ilan University, New BESA Publications, Mideast Security and Policy Studies, No. 39, July 1998, Section 3.1.

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# Victor's Poison: Explaining Intelligence Failure On Yom Kippur

By ASP Devadas Krishnadas, SPF

The triumph of the Six-Day War in 1967 had given a tremendous boost to the self-confidence of the Israeli Defence Forces (IDF) and the nation. The people and government of Israel also acquired a political novelty. For the first time, a palpable sense of security pervaded the Israeli political environment. The State of Israel had a violent gestation as well as birth. Independence in 1948 came in the van of devastation of the Holocaust and a vicious guerrilla campaign against British occupation forces after the end of World War II. Israel had fought four major wars between its establishment in 1948 and the commencement of the Camp David meetings in 1978. In each one, Egypt had been a major opponent. The War of Independence 1948 – 1949 saw Israel invaded by the armies of six Arab nations: Egypt, Syria, Transjordan (later Jordan), Lebanon, Iraq and Saudi Arabia . In addition, local Arab Palestinian forces also fought the Israelis. This was followed by the Sinai War in 1956 which resulted in the invasion and temporary conquest of Egypt's Sinai Peninsula by Israel , while France and Great Britain seized the Suez Canal. These events occasioned a well developed "siege mentality" which framed the outlook of the Israeli people and its leaders.

By the late 1960s, the Anti-Israeli sentiment among the Arab states reached a boil upon which Egypt ' s President Nasser sought to capitalise his claim to Pan-Arab leadership. He knocked together a coalition for an attack aimed at effectively destroying the vaunted Israeli armed forces and thereby making Israeli nationhood untenable. 1 However, just before the preparations reached fruition, Israel launched its stunning pre-emptive attack which annihilated the air forces of Egypt , Syria , Jordan and Iraq . In a matter of days their ground forces were similarly routed. This episode became known as the Six-Day War of October 1967. The triumph on the battlefield left Israel in possession of the West Bank from Jordan, the Golan Heights from Syria and the Gaza Strip and the Sinai from Egypt . Its tanks had rolled to a stop on the banks of the Suez Canal . Most of all, the city of Jerusalem , sacred to Jews, Muslims and Christians alike, was in Israeli hands. Following the war, United Nations Resolution 242, " Concerning Principles for a Just and Lasting Peace in the Middle East " 2 affirmed the right of all nations in the region to live securely within their respective borders which effectively endorsed Israel ' s claim to be a sovereign nation. The victory left Israel confident and proud of its military prowess while demoralising those of its enemies. Nasser did not long outlast the humiliation of the defeat 3 and was replaced by his deputy who, unknown to any at the time, would be the man who would perpetrate upon Israel a strategic surprise to match what it had inflicted upon Egypt in 1967 – he was Anwar Sadat.

Anwar Sadat had, with Nasser , been one of the original cadre of young officers who agitated for independence from the colonial influence of the Western powers as well as the supine reign of King Farouk. While Nasser rode high on the horse cross-bred between nationalism and nascent Pan-Arabism, Sadat had stayed quietly loyal. So he was as yet a relatively unknown quality when he assumed the presidency in 1970. He faced an economy on the ropes, a people demoralised and a military defeated. Sadat set himself, " the basic task is to wipe out the disgrace and humiliation that followed from the 1967 defeat. I reckoned that it would be 1,000 times more honourable for us – 40,000 of my sons in the armed forces and myself- to be buried crossing the Canal than to accept such disgrace and humiliation. " 4

Between 1967 and 1970, when Nasser fell from power, Israel and Egypt fought a low intensity conflict, the so-called " War of Attrition " . In the subsequent three years, Sadat consolidated his power and made overtures of peace. In 1971, Sadat unilaterally proposed an initiative for peace which offered to agree to a mutual withdrawal of forces along the Suez Canal, normalise relations with the United States and conclude a peace treaty with Israel. 5 Israel, basking in its sense of military superiority, ignored the signals while the Nixon administration, wrapped up in the Vietnam War and the emerging Watergate scandal, did not see the Middle East as a priority. Sadat seemed to have interpreted this personally, believing that both he as a leader and Egypt as a country were not being taken seriously. He recorded his disgust in his memoirs where he asserted that, " If the United States or Israel had shown enough interest in that Initiative, the October War would not have taken place and the process of negotiating peace would have started in February or March 1971, I was capable of saying and doing things no Arab leader had yet dared to do for the past 22 years. For all this, however, the Americans did nothing. " 6 Sadat recognised that to reach any kind of settlement he had to first restore Arab pride, secondly discomfort Israel sufficiently to interest them to talk and finally, involve the superpowers to act as guarantors. Sadat also decided that Egypt ' s aims were best served working with the United States and not its long-term patron – the Soviet Union . In an example of what would become his trademark " electric shock " diplomacy 7 , Sadat summarily expelled all Soviet advisors from Egypt in

July 1972. 8

In October 1973, on the Jewish holy day of Yom Kippur, Sadat together with Assad of Syria launched a two-front surprise attack upon Israel. Although the Yom Kippur attack ultimately proved a tactical defeat for the Arab forces, it demolished Israel's sense of security. Following the successful 1967 campaign, the Israeli high command had ascended the heights of hubris from which they would fall heavily. In the days immediately prior to Yom Kippur, Israeli intelligence was comfortably dismissing any prospect of an attack while the military scoffed at the possibility that any such attack could succeed given the perceived in-competence of Arab forces. 9 Within days of the attack, their charismatic Defence Minister, Moshe Dayan would be exclaiming that the "Third Temple" was in danger of falling. 10 Israel's ability to snatch victory from the jaws of defeat led to an acceptance among the Arab belligerents of UN resolution 242, effectively, providing Israel with recognition as a State among its unhappy neighbours. Welcome as that step was, it had come at the high cost in terms of material and lives to Israel. The grievous material losses in the opening days of the conflict had only been made good through massive military assistance from the United States. By the same token, the United States recognised that it could not leave its ally to provide security for itself. Any idea that Israel could be self-sufficient in ensuring its own security was ended.

How had the Israelis failed to anticipate the Arab attack? What are the insights into strategic surprise which can be solicited? What institutional implications follow from those insights and what recommendations can be made to deter strategic surprise? These are the vital questions which this paper will address. This paper adopts Levite's definition that strategic surprise is a sudden realisation that one has been operating on the basis of an erroneous perception of threat. 11 To be considered strategic as opposed to tactical, such a surprise must have implications on the national interest. For the purposes of this study, such a surprise must also meet two conditions. Firstly, that it occurs through a failure to anticipate on the part of the victim. Secondly, that it results from the deliberate action on the part of the perpetrator.

The clearest manifestation of a strategic surprise framework is in the context of an attack warning. An attack warning is defined as the timely and accurate anticipation of the enemy's intention to attack. The notion of adequacy is important as there is only value if such anticipation is achieved early enough to be acted upon. In the Yom Kippur scenario for instance, the commitment on the part of the A'man, the responsible Israeli intelligence agency to declare an attack warning, 12 came only hours before the Arab assault – too little time to effect adequate counter arrangements. In general, the earlier an accurate estimation of the enemy's intention is made, the greater the range of responsive options available to the potential victim.

There were four notable intelligence bodies which formed the Israeli intelligence community by the late 1960s. 13 Mossad which was responsible for foreign intelligence, Shin Bet which focused on internal security with special emphasis on counter-intelligence on Arab terrorist activity, a small Foreign Office Intelligence Cell, and then there was A'man. The responsibility for producing national intelligence estimates rested upon A'man or the Military Intelligence Branch of the IDF. It would be this organisation upon which rested the burden of not only estimating enemy intentions but also giving adequate war warning. A'man had its roots in the humble beginning of the IDF Intelligence Department after the successful war of 1948.

In 1953, the Intelligence Department received new responsibilities trans-forming it into A'man with Branch level status in the IDF organisational hierarchy. This change of status was more than organisational semantics. It meant that A'man officers were now concurrently operational intelligence officers as well as staff officers in the wider and growing Israeli intelligence community, one in which A'man as an institution was becoming more prominent. 14 Through the 1950s and early 1960s, A'man and the Israeli foreign intelligence service, Mossad, fought a turf war for the control of the agenda of the Israeli intelligence community. The frictions were in part attributable to the fact that Mossad was staffed by civilian intelligence officers while A'man was an uniformed military agency. The civilian staffing of Mossad gave it the persona of an elite and independent service while A'man, being part of the conscript based IDF, assumed an egalitarian, more regimented personality. In 1963, Prime Minister Ben-Gurion settled the contest in A'man's favour when he appointed its serving head, Major General Meir Amit, as director of Mossad. Amit worked to repair relations between the two services and brought A'man-style discipline and order to the more free-wheeling practices of Mossad. 15

In the lead up to the October 1967 War, A'man achieved considerable success in helping the Israeli Air Force (IAF) with data to update their pilots' target folders and identify the best strike window. These inputs contributed to the astounding results of the IAF pre-emptive strikes which destroyed most of the Arab airforces on the ground. A'man's signal intelligence arm also scored a coup when it intercepted a phone call between President Nasser of Egypt and King Hussein of Jordan concocting a false story to explain their collective defeats with claims of the military involvement of the United States on Israel's behalf. 16 The Israeli government released a tape recording of the conversation causing enormous embarrassment to the Arab world. It also raised the esteem both in the public and in the government of A'man's capabilities.

A ' man , being a military body, was and remains, apolitical and regimented. Only its service head reports to the Prime Minister and Cabinet. The service head is also, alone among Israeli intelligence agency directors, publicly identified. 17 These qualities provide the incumbent Director of A ' man with enormous personal influence over the efficacy of Israeli intelligence efforts, particularly those geared towards providing war warning. The Director at the time of the 1967 war was Major General Aharon Yariv. Born in Moscow , he had emigrated to Palestine , fought with the British Army, before finally joining the infant IDF after the War of Independence. An officer with wide field, staff and intelligence experience, he had also served a stint as the IDF attache in Washington D.C. The attractiveness of his personality, professionalism of his conduct and effectiveness of A ' man ' s performance under his stewardship would not only be a credit to him but institutionally, it would add lustre to the office of Director. While this could make the job of the Director more effective, much would depend on the calibre and personality of whoever that Director happened to be at any given time. In 1972, Yariv handed over the reins to Major General Elihayu Zeira. Like Yariv, Zeira had field, staff and overseas experience. However, unlike the more cautious Yariv, Zeira was an officer of supreme confidence both in his own judgement as well as Israel ' s military prowess. 18 The stature of the office of Director which Yariv had inadvertently helped build up was to become Zeira ' s poisoned chalice.

There are broadly speaking, two schools of thought which address the issue of strategic surprise. The first can be classified as the victim ' s school which focuses on explaining surprise in terms of conditions which obviate the victim from being surprised. Roberta Wohlstetter fits neatly into the victim ' s school when she attributed the strategic surprise at Pearl Harbour , not to the poverty of information, but the presence of noise which made it difficult in real time to accurately interpret the attack warnings. 19 Wohlstetter drew a distinction between noise and signals which continue to inform any analysis of intelligence data. She defined signals as, " a sign or piece of evidence that tell us about a particular danger or a particular enemy move or intention. " 20 Noise she defined as data which was essentially useless for anticipating warning but which cluttered and confused the total analytical picture while burdening the efforts of intelligence analysis assets. 21 She correctly pointed out that in hindsight, it was relatively easy to pick out the pattern of reliable attack warning indicators or signals and to form the conclusion that such a warning was both clear and consistent.

The second school may be referred to as the surprier ' s school and seeks to explain surprise in terms of actions on the part of the perpetrator to inflict surprise. 22 Barton Whaley has a good representative example. In studying the 1941 German invasion of the Soviet Union , Operation Barbarossa, he emphasised the role of deception. The Wohlstetter model treated noise and signals as a matter for the analysts to distinguish through interpretation. The Whaley model introduced the notion of strategic surprise through the agency of deception. 23 Thus noise and signals could be injected by the perpetrator to deliberately mislead the victim. Under this model, the task of the analyst is far more complicated. He or she must not only distinguish between noise and signals but also authenticate both. The authentication process serves two vital needs. Firstly, it serves to validate signals ensuring that those acted upon are bona fide. Secondly, it must decipher the intent and method behind the enemy deception plans so that an analytical framework can be engineered to accommodate for the deception.

Intelligence organisations have typically two principal components. The first component is an information gathering capability. It is the information gathering apparatus which collate the noise and signals. Information can be gathered through two broad mechanisms. The first is Human Intelligence (HUMINT) and the second is Technical Intelligence (TECHINT). 24 Human Intelligence is typified by the reliance on agents to penetrate essential data centres of a targeted country. Such penetration can be achieved directly by an agent infiltrating the identified organisation or by recruiting indigenous staff to betray, knowingly or otherwise 25 , their own organisations. Agents can also infiltrate countries for the purpose of gauging their public sentiment and making general observations about social changes. This can be of particular importance when dealing with ' closed ' countries or at least countries ' closed ' to the interested party as was certainly the situation which faced Israel when dealing with its Arab neighbours. From the 1960s into the 1970s, Israel possessed an established capability for HUMINT. Its most notable case being that of Eli Cohen, based in Syria in the guise of a monied Arab playboy, who provided key intelligence through his contacts in the Syrian establishment. Cohen was eventually detected, tortured and executed. By which time however, a new, and till today unidentified, source had been cultivated in Egypt . He was so well-placed and sophisticated in his operation that only the Director of Mossad, the Israeli Foreign Intelligence Agency, handled him. He was known only as " The Source " . His greatest value lay in the potential to deliver a credible and timely attack warning. 26

TECHINT covers a wide span of technological means of information gathering. The two main streams of TECHINT are signals and imagery. Signals intelligence (SIGINT) refers to the interception of the target countries ' electronic or telephony communications. A ' man , or Military Intelligence, had responsibility for SIGINT while the Israeli Air Force provided Imagery intelligence (IMINT) which included photo reconnaissance, infra-red scanning to provide visual data. 27 Signals intelligence may be conducted vertically as well as horizontally. Vertical collection involves interception of specific tactical and strategic communications such as those of Headquarters and Field Formation Units. Horizontal collection involved the scanning of a breadth of communication genre such as political

broadcasts, level of general communication flow within the military and telephony conversations of civilians in sensitive areas. Imagery served to update target folders in contingency or “ drawer plans ” , permitted monitoring of troop movements and build-up of existing material or introduction of new technology such as surface-to-air (SAM) missile types.

The information gathered by a well- developed intelligence engine would be voluminous. It would also be confusing and sometimes contradictory. It would also conceivably include deception input deliberately fed to collection sources. To be in anyway useful, in-formation needs to be analysed. Analysis is the second major component of any intelligence organisation. This work is conducted by analysts whose particular skills are married up with congruent areas of intelligence. For instance, Arab speakers would be deployed to Arab intelligence sectors broken down into various countries or thematic section referred to as “ desks ” . It is the task of the analysts to make sense of the incoming data.

A cogent process of analysis would typically involve prioritisation. Prioritisation is necessary to deal with the paradox of managing infinite needs with finite resources. Often the decision on prioritisation is not exclusive to the intelligence professionals but contingent on the agenda set by political leaders who frame the national policies. As Shaim has observed, “ Good Intelligence management must begin with a decision of what needs to be known; such a decision cannot be taken independently of the preoccupations of those in charge of policy. Intelligence is not knowledge for its own sake but for the practical purpose of taking action. To perform its task, the intelligence organisation needs to know the issues and problems with which the policy makers are concerned. Without this knowledge, the organisation ’ s fact gathering will be diffused and unsystematic, and policy makers will not be provided with the relevant information on which to base their policy. ” 28

The ultimate aim of analysis is to make an estimation of an enemy ’ s intent, of which the most sensitive expression is their proclivity towards aggression. 29 These forecasts are distilled into intelligence briefs which are generally referred to as National Intelligence Estimates (NIEs). The NIE would inform the policy agenda of the political leadership in fundamental ways. It is often the basis to determine basic national interest issues such as levels of defence expenditure, what should that expenditure be focused on and at what level of readiness should the armed forces be held at. All these decisions involve massive cost variables which play into the larger national political matrix. In other words, monetary costs on such scales have companion political costs in terms of opportunity costs in national allocation of resources as well as socio-political implications.

The NIE is not merely a collection of authenticated data but builds on that data to form suppositions of the enemy ’ s thinking. To provide an effective frame of reference for policy makers to rationalise the impact of their policies, it typically also includes assumptions about two critical constructs. The first is an enemy ’ s intent, which is essentially a reference to the bottom line policy agenda of the opponent. The second is an enemy ’ s capabilities. Capabilities refers to the practical tools available to an enemy such as its economy state, calibre of armed forces, level of military technology, degree of regional or international support and strength of the current political leadership. Taken together, there is still a need to make assumptions about the engineering in the enemy ’ s thinking. This permits scenario building and serves as the theoretical laboratory for forecasting potential future intentions.

Scenarios are essentially stories which seek to outline several plausible future states which help guide policy. It rests partly on concrete known data supplemented by educated guesses and partly on assumptions about enemy behaviour. In 1973, the Israelis had formed a scenario for war with Egypt and Syria , its two biggest contiguous Arab states. Given the history of conflict between Israel and its neighbours, the scenario assumed a high degree of hostility in the intentions of Egypt and Syria . The trend of victorious outcomes for Israel in that history of conflict, most notably the 1967 campaign, led A ’ man analysts to sub-textually inform the scenario with a poor view of their capabilities. The scenario forecast war only upon the fulfilment of certain conditions. The first was that Egypt would not go to war unless it was confident of achieving air superiority over the Israeli Air Force (IAF), most desirably through destroying it on the ground via deep penetration strikes at major IAF bases. The second condition was that Syria would commit to war only in combination with Egypt . This scenario was referred to as Ha ’ konzeptzia or “ the Concept ” and it would play a crucial role in under-standing the strategic surprise of Yom Kippur. 30

Avi Shlaim has outlined the role of entrenched conceptual analytical frameworks. Such conceptual frame-works can either be manipulated by the enemy to work against the victim by obviating his or her accurate analysis of unfolding events. Alternatively, an entrenched scenario could cause rigidity in the analytical process. Shlaim has noted that, “ Once a preconception or a theory about the enemy behaviour becomes settled, it is very hard to shake until it is too late because of the human attachment to old beliefs and the equally stubborn resistance to new material that will upset them. ” 31 The scenario begins to function as a filter through which all data is coloured thus creating a self-deceiving cycle of reinforcement. This could manifest itself in ‘ wishful thinking, which “ permits the observer ’ s individual wishes and aspirations to suppress uncomfortable evidence ” . 32

In the lead up to the attack on Yom Kippur, A ' man received several signals which should have alarmed them sufficiently to revisit the scenario assumptions which underpinned their intelligence estimates. The history of defeats which Israel had inflicted upon its Arab neighbours made them confident in both their ability to face down any threat, and in their belief that their enemies had been sufficiently humbled not to attempt anything rash again. Zeira ' s confidence in being able to provide sufficient attack warning was also founded on his faith in the fidelity of " The Source " . In early spring 1973, intelligence had detected large Egyptian troop movements. Even " The Source " communicated a warning that Sadat intended to go to war. The Chief of General Staff, General David Elazar, and the Director of Mossad, Zvi Zamir, argued that Israel should move to an anticipatory war footing. Zeira countered that, despite the evidence, his own analytical judgement and " The Concept " guidelines, suggested that Egypt was merely posturing and that the probability of war was low. Golda Meir, the Prime Minister, authorised Israeli forces to move to alert status " Blue-White " . This involved expensive and extensive preparations into deployment of units, activation of some reserves, and stockpiling of inventory and supplies. Ultimately, nothing happened.

Zeira stood vindicated. The Chief of General Staff and the Director of Mossad, the two other key institutional security advisors to the Government were embarrassed by the episode. Conversely, the Government ' s stock in Zeira ' s judgement rose. Zeira himself interpreted his role in the light of the " Blue-White " episode as a calming and rationalising agent against " cry-wolf " tendencies. Ironically, just as Zeira ' s reputation reached its zenith, the presumptions upon which his judgements were based were changing rapidly.

Klaus Knorr has distinguished between purely " technical surprise " and what he termed " behavioural surprise " .<sup>33</sup> He asserted that " behavioural surprise " occurred, " when the op-ponent ' s behaviour is incompatible, or seems incompatible, with our set of expectations " . He identified three causes of " behavioural surprise " . Firstly, the opponent ' s behaviour pattern may alter as a result of a change on leadership or ideology. Secondly, the guiding scenario may be unrealistic due to incompetent analysis or the influence of " national images " of the opponent. Thirdly, an opponent may behave irrationally.

The strategic surprise suffered by Israel on Yom Kippur can be clearly classified as a classic example of Knorr ' s " behavioural surprise " model. In the first instance, Egypt acquired a new leader in 1970. Sadat was of a very different temperament than Nasser . He also was committed to an agenda of addressing the Arab pride, damaged by the repeated defeats, most recently in 1967. The model of rationality applied by the " The Concept " was that the Arabs would not attack without first assuring themselves of air supremacy. This was in line with Israel ' s own war strategy as evidenced by their pre-emptive strike at Arab airforces in 1967. Israel ' s confidence in its military prowess was principally manifested in two notions. The first notion was that its airforce and tank formations were undefeatable. After all, the IAF had delivered the astounding pre-emptive strike in 1967 and bested every Arab airforce in air combat. IDF tank formations had exploited the opportunity, devastating opposing formations and conquering the Sinai, the West Bank and the Golan Heights . The second notion was a well-developed contempt for the quality of the Arab fighting soldier. He was considered weak, poorly trained, uncommitted and ill-led. These two notions laid the seed of complacency in Israeli perceptions of Arab capabilities and intentions.

However, Sadat ' s generals, acknowledging the qualitative superiority of the IAF, placed their faith in SAM technology as a countervailing weapon against past IAF dominance. Hundreds of batteries of Soviet-supplied SA-2, SA-3 and new SA-6 SAM systems were acquired. The Egyptian attack plan called for the ground forces to advance under the protective umbrella of the SAM systems. When IAF fighters attempted to provide Close Air Support (CAS) or conducted tank killer operations, they flew into a barrage of missiles which resulted in the highest loss of IAF aircraft in its history. For most of the war, the Egyptians operated their combat aircraft within the protected envelope of the SAMs. These IAF pilots were reduced to engaging both air and ground targets in the face of the SAM peril. By the end of the conflict, more than 100 or nearly a quarter of IAF pre-war operating strength had been lost, mostly to SAM and its protective Anti-Aircraft Artillery (AAA) batteries. The initial high losses staggered the supremely confident pilots and their commanders. Only the eventual overrunning of SAM sites on the ground and the deployment of hastily acquired American counter-measure systems turned the tide in favour of the IAF which moved swiftly to extract revenge on Arab pilots.

A similar approach was taken with a view to defeating Israel ' s much vaunted tank formations. The Egyptians flooded their frontline formations with tank busting rocket-propelled grenades and wire-guided Sagger anti-tank missiles which proved an ugly surprise. In the opening phases of the conflict, hard charging Israeli tank commanders found themselves continually having their tanks shot out from under them, Those who escaped with their machines still running often found them draped with wires from Sagger shots which had missed or passed over heading for another target.

Another startling discovery was that, unlike their comfortable assumption, the Arab soldier was not only fighting but also advancing. Under Sadat, the whole incompetent crony-filled officer corps had been overhauled with the eviction of the incompetent and the introduction of whole cadres of university-educated officers and non-commissioned

officers. These men were highly educated enough to effectively operate the new weapon systems and having achieved their ranks through merit also proved to be able leaders. A 'man had been aware of this re-generation but had dismissed its significance – an Arab was an Arab. A 'man's "national image" of the Arab, in particular of the Egyptian soldier had become discordant with the new image being crafted on Egyptian training fields.

"The Concept" was constructed in terms of a war aimed at destroying Israel. However, Sadat's agenda was to restore Arab pride by displaying military prowess in a limited conflict. His aim had been to fight a short but sharp war which would be quickly brought to a political solution before the gains from the strategic surprise were lost to an Israeli counter-attack. Hence, the terms he sought for war were different from the conditions necessary for the protracted fight to the finish. A 'man's assessment of Egypt's poor economic state and interpretation of Sadat's expulsion of the Soviet advisors was that these were conclusive signals that Egypt not only would not but could not fight a war. Sadat's short war strategy avoided the costs of a full-out war which Egypt could not afford. A 'man's and the IDF's contempt for the Arab military also led it to believe that it was totally reliant on its Soviet advisors to be effective. Not only did they not appreciate the significance of the educated Arab frontline junior leaders but it also failed to appreciate the political motivation behind the expulsion. Sadat intended any eventual victory to be a wholly Arab triumph. Egypt under Sadat no longer operated under the "rationality" of "The Concept". Given the linked feature of "The Concept's" two conditions, if the estimation of Egypt's terms for war was wrong, then automatically, the presumption that Syria would only go to war in company with Egypt would fulfil its promise. Syria would launch a parallel attack on Israel initiating a strategist's worst nightmare - a multi-front war.

In the final weeks and days before Yom Kippur, Zeira's attachment to "The Concept" and his confidence in his own judgement now supplanted even the word of "The Source". After all, "The Source" had seemingly made a wrong call in the spring. His posture communicated itself to his key subordinates fatally blinding them to the increasing evidence of Egypt's intention. Egypt had also practised artful deception tactics. It had for the preceding few years practised annual manoeuvres on their bank of the Suez. The movements of Egyptian units in the count down to Yom Kippur were treated by A 'man as routine. The Egyptians, trying to leave little to chance, built up high sand banks on the Canal edge to mask their activity from Israeli observers situated in watch towers. In the final days before the assault, Sadat de-mobilised large formations of the Egyptian reserves to lull the Israelis into a sense of security while concurrently bringing up greater numbers under the cover of darkness. Knowledge of the final attack order and plans were kept a closed circle with frontline commanders not being informed until the penultimate days. Zeira looked at these signals as reassurance but the deception plans did not fool everyone.

In the final few days before the assault, Lieutenant Benjamin Siman-Tov, a young A 'man analyst attached to the critical Southern Command, authored two consecutive reports which catalogued observations of an Egyptian military build-up and suspicious SIGINT. His first report was tellingly entitled, "Movement in the Egyptian Army – Possibility of Resumption of Hostilities".<sup>34</sup> His senior Intelligence supervisor, LTC David Geddaliah, ignored them. Siman-Tov was not alone in his alarm. "The Source" was also active. He communicated an unambiguous attack warning. It was not taken seriously until it was too late. Those who were growing increasingly alarmed at incoming routine data from SIGNINT and IMINT, including David Elazar, were hesitant to run the risk of seeming to "cry wolf" yet again. Zeira, supremely confident that "The Concept" guided a conclusion of "low probability" for war sought to play his self-prescribed role as a calming agent. Right up to the final hours, Zeira clung to his forecast. The Victor's Poison of overconfidence brewed with complacency and contempt had worked its damage.

At its root, the strategic surprise of Yom Kippur is founded on the overwhelming confidence of the Israeli intelligence, military and even political mind set. The elaborate Egyptian deception plans contributed but cannot explain or be legitimately constructed as the principal cause of the surprise. The post-war Agranat Commission clearly attributed the principal failing to a zealous attachment to "The Concept". This attachment introduced a cybernetic model of thinking into the intelligence assessment process. Cybernetic modelled thinking affirms that analysis should avoid multiple definitions of a situation because such diagnosis introduces additional complexities and uncertain-ties.<sup>35</sup> It is the ultimate expression of the principle, "Occam's Razor" that one should not increase, beyond what is necessary, the number of entities required to explain anything. Applied to the assessment of Egyptian intentions through the optic of "The Concept", Zeira and his chief analysts eliminated or downgraded contradictory evidence from consideration.

However, it would be simplistic to explain the strategic surprise solely in terms of analytical rigidity in terms of "The Concept". This paper has argued that the Israeli mental model was also significantly influenced by a fatal sense of over-confidence. This overconfidence was acquired progressively over decades of conflict. It grew to the point where it framed the Israeli perception of Arab capabilities and to an extent their intentions. Such overconfidence led to an underestimation as well as misperception.

The above graph plots the Israeli's level of confidence over time and marks its rise through several escalating

stages. In its first conflict, there was high uncertainty of the outcome as the nascent nation struggled in the face of larger powers to consolidate its claim to sovereignty. The success of the 1948 War of Independence encouraged the newly institutionalised IDF which showed its mettle in the 1956 Sinai Campaign. The positive results of IDF operations were testimony to the spirit and professional competence of the pioneer cadres of professional officers and raised self-confidence to the point of cautious optimism. At this stage, there is still much healthy respect for the capabilities of the opponent and a keen awareness of one's own vulnerabilities and limitations.

However, the Six-Day War's astonishing rout which the IDF land and air forces inflicted on multiple opponents rocketed Israeli self-confidence. It had started the war with belligerent optimism which reflected itself in the choice of a pre-emptive strike. However, that choice was also conditioned by a clear sense of vulnerability which demanded the advantage of a surprise attack as reassurance. The three years of the War of Attrition which saw the IAF repeatedly shoot down Arab jets with no losses to themselves, boosted the overall sense of self-confidence to the heights of reinforced optimism. By 1973, three years after the War of Attrition, Israeli confidence had reached the point of fatal optimism. It was from this peak that the IDF fell with the rude shock of Yom Kippur. The recovery of its optimism would be bought at a high price on the battlefield.

### **The Victor's Poison**

It is possible to construct a simple conceptual metric to outline the point of vulnerability. It is at the point of incidence between an ascending index of self-confidence and a descending index of respect for one's opponents. From this point, one is increasingly at risk of suffering from, what this paper, refers to as Victor's Poison. This is where the trend of past successes creates a psychological construct which predisposes a historical victor to future strategic surprise. The Israeli case of Yom Kippur is a clear illustration of the mechanism and ultimate effect of Victor's Poison.

There are several institutional means to prevent the onset of Victor's Poison. In the first instance, orthodox conceptual frameworks of analysis should be subject to regular review. These reviews should aim to revalidate the fundamental assumptions which support the framework. Scenarios of potential variations in the conceptual framework should be developed and ranked in order of likelihood. This would permit some order of relative risk analysis as a guide to interpretation. However, such a practice could create the perception of inconsistency which may irritate policy clients. Also, excusing sudden dramatic variations, it may be using only incremental or marginal changes in the data, to urge modifications in the fundamentals of existing conceptual frameworks.

Intelligence communities should introduce the practice of operating "Team Bs". This refers to the deliberate establishment of units whose aim is to throw up challenges to received wisdom, as an aid to new thinking. There should be institutional sanction for the operation of such "devil's advocate" sections to reassure their members who may fear the potential for backlash from challenging the hypothesis of senior officers. Operating Team Bs within an intelligence agency is only one of two approaches using this philosophy. The second would be to give multiple agencies the responsibility for developing NIEs. Alternatively, NIEs developed by a primarily tasked agency should be subject to consideration by another competent organ. Either approach would create opportunity for a "check and balance" analysis. However, the downside would potentially be bureaucratic in-fighting or interpretations compromised to be acceptable to all. The first would be a costly distraction while the second could be an even more costly corruption of the analytical value.

It could be suggested that analysts should not be permitted to stay too long working a particular desk but instead be moved so that they do not become stale in their thinking. Yet, such a practice would be counter to the necessity of developing analytical expertise. It would also be difficult to institutionalise on a practical level given the nature of typical intelligence organisations which for reasons of security are internally compartmentalised.

Ultimately, these are institutional solutions to a human problem. As such, there is no guarantee of success. Victor's Poison works itself into the marrow of a victim's psyche through the psychological "back door" of emotion. Because it typically pervades one's whole community, it is difficult to develop independent countervailing pressures. The establishment of institutional practices would also not obviate scenarios where senior figures refuse to accept alternate analysis. The example of Zeira and Geddaliah demonstrates how difficult innovation in thinking can be in a hierarchical and compartmentalised organisation. Ultimately, Victor's Poison is its own antidote. If the victim survives a strategic surprise, it will find the poison neutralised. In this, human nature displays a predilection for conceptual poetry which any intelligence analyst would appreciate.

## Endnotes

- 1 Oren, Michael B., *Six Days of War*, ( New York, Ballantine Books, 2003), p31.
- 2 Ibid., p326.
- 3 After 1967, Nasser fell into a protracted period of illness before dying in 1970. Sadat, Anwar, *In Search of Identity*, (New York, Harper & Row, 1978), pp180-203.
- 4 Ibid., p215.
- 5 Ibid., p279.
- 6 Ibid., pp280-281.
- 7 Handel, Michael I., *The Diplomacy of Surprise*, (Massachusetts, Harvard Studies in International Affairs No. 44, 1981), pp275-277.
- 8 Ibid., p278. Sadat was also motivated by the desire to craft the coming war with Israel as an Arab success rather than one achieved with Soviet guidance.
- 9 Rabinovich, Abraham, *The Yom Kippur War*, ( New York, Schocken Books, 2004), pp22-24.
- 10 O 'Ballance, Edgar, *No Victor, No Vanquished*, (California, Presidio, Press, 1997), p174. and Rabinovich, Abraham *Op Cit.*, p219.
- 11 Levite, Ariel, *Intelligence and Strategic Surprises*, (New York, Columbia University Press, 1987), p1.
- 12 Rabinovich, Abraham, *Op Cit.*, p22.
- 13 Shlaim, Avi, "Failures in National Intelligence Estimates: The Case of Yom Kippur ", *World Politics*, Vol.28, No.3 (April, 1976), p368.
- 14 Katz, Samuel M., *Soldier Spies: Israeli Military Intelligence*, (California, Presidio Press, 1992), p75.
- 15 Ibid., pp158-159.
- 16 Ibid., p195.
- 17 Ibid., p7.
- 18 Rabinowitz, Abram, *Op Cit.*, p21.
- 19 Wohlstetter, Roberta, *PearlHarbour: Warning and Decision*, (Stanford, Stanford University Press, 1962)
- 20 Ibid., p2.
- 21 Ibid., p3.
- 22 Hybel, Alex Roberto, *The Logic of Surprise in International Conflict*, (Toronto, Lexington Books, 1986), p3.
- 23 Whaley, Barton, *Codeword BARBAROSSA*, (Cambridge MA, MIT Press, 1973).
- 24 Shulsky, Abram N., *Silent Warfare: Understanding the World of Intelligence*, (New York, Brassey 's, 1993), p11.
- 25 "False Flag " recruitment can cause a subject to be misled into believing that he or she is helping an ally or supporting their own government when in fact their 'handlers ' represent the enemy.
- 26 Rabinovich, Abraham, *Op Cit.*, p22.
- 27 Yonay, Ehud, *No Margin for Error: The Making of the Israeli Air Force*, (New York, Pantheon Books, 1993), p309.

28 Shlaim, Avi, Op Cit., p366.

29 Raymond Garthoff has made a useful study of the inherent trickiness of making such estimations. See, Garthoff, Raymond L., 'On Estimating and Imputing Intentions ', International Security, Vol.2, No.3 (Winter, 1978).

30 Shlaim, Avi, Op Cit., p352. and Katz, Samuel M., Op Cit., p235.

31 Shlaim, Avi, Op Cit., p371.

32 Shlaim, Avi, Op Cit., 360. and Jervis, Robert, Perception and Misperception in International Politics, (New Jersey, Princeton University Press, 1976), p356.

33 Knorr, Klaus, 'Failures in National Intelligence Estimates: The Case of the Cuban Missiles ', World Politics, Vol.16, No.3 (April, 1964), p462.

34 Shlaim, Avi, Op Cit., p353.

35 Maoz, Zeev, National Choices and International Processes, (Cambridge, Cambridge University Press, 1990), pp180-181.

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# Viewpoints: Pointers from the Past, Foresight into the Future

Some six years ago, I published an article in POINTER entitled “ Grooming and Grounding Heartware: SAF Leadership Challenges at the Dawn of the 21 st Century. ” In it, I argued for the importance of keeping our “ corporate memory ” alive and relevant in the face of rapid change and complexity. The issue was set against the context of the ‘ keep SAF young ’ policy with relatively short career timelines for regulars, and National Service cycle churning out thousands of conscripts back to civic street every year. With such a dynamic organisational flow-through, the hollowing-out effect can be a real and consequential one. Therefore, I opined that a soul-deep understanding of SAF ’ s history – one inextricably woven in the fabric of our nation building story and laced with colourful lessons and icons from the past and present – would inspire and motivate our soldiers to build on our rich institutional legacy with even greater pride of purpose. After all, a strong sense of history not only refreshes institutional memory, revitalises traditions, reinforces identity, it can further ground and groom our heartware, even as our 3G hardware grows and IKC2 software becomes more sophisticated.

It was therefore with a nodding sense of déjà vu when two recent commentaries in the local print media focused on the issue of tapping the experience and wisdom of our more senior citizen mentors amongst us. Many of whom may be retired but still have a reservoir of knowledge and relevant experiences to share and contribute to Singapore ’ s progress in general and the SAF ’ s transformation in particular that could be better tapped. It would appear that my arguments since, have gained even greater saliency and urgency in the wider Singaporean social discourse; especially with the twin trends of earlier career retirements and a rapidly aging population fundamentally reshaping our national demographics.

The first article by David Boey (“Old Soldiers Still have Something to Teach” in The Straits Times, 28 Sep 04, p. 12), relates directly to the SAF and how as we transform as a fighting organisation into the future, we could seek out ways of harnessing the wisdom of former soldiers who can help to prevent us from chasing down blind alleys and relearning past mistakes. As Boey had put it in his call for harnessing the blasts from the past: “ Knowledge is a force multiplier. Singapore should thus capitalise on the knowledge gained by successive cohorts of military men. ” This is an important pointer considering that many of our ex-NSmen and former regulars have moved on to the corporate world and potentially have much to share by way of former and new experiences that may be relevant for the SAF.

The second commentary by Zuraidah Ibrahim (“Retired, not Tired – Let’s Hear from Them Too” in The Straits Times, 16 Oct 04, p. H13) cautioned against making the all too commonplace assumption these days that only the young have a monopoly on the newest, the best and the most creative ideas. She argued that the old may be “retired but not tired” , and clearly “have their relevance still” in mentoring and providing useful feedback to better shape policy formulation. How to continue to retain the services of retirees and former incumbents, who can still contribute, will no doubt require further study as she readily admitted.

Such media commentaries and social discourses are likely to grow as Singaporeans live longer and healthier lives, and step down from their career posts well even before they have passed their peak to make way for the young.

All said, assuming that the clarion calls above are to be heeded, one of the priority action items for the SAF then is that of identifying and leveraging on the best media, platforms and channels through which some of our retired SAF personnel and former military men can continue to stay engaged in shaping the 3G SAF and beyond.

While we could explore many novel ways of tapping on the experience of ex-SAF personnel, like Boey ’ s radical proposal for the setting up of SAF Oversight Committees staffed by ex-SAF personnel as “devil’s advocates and sounding boards to help weed out unsound or impractical ideas” , my suggestion here is more modest and readily “do-able” with minimal outlay, red-tape or polemic.

Specifically directed at our very own premier military journal, I suggest that POINTER can help to play a useful role in building up our knowledge bank, albeit even if limited one at that, given the print space limitations and quarterly topical constraints.

For a start, POINTER the print journal could consider featuring some notable SAF veterans and NSmen (former soldiers and commanders) who have professionally interesting experiences and relevant stories to share. These could be featured in the quarterly journal by way of select interviews or solicited article contributions. Research

access to the Oral History interview transcripts of former SAF and MINDEF personnel, collated over the years by MINDEF 's Centre for Heritage Services, would readily provide a rich source of raw material for mining old insights. The focus of such pieces could be on sharing "real stories and adventures and misadventures of the early days," as has been suggested in Boey's article. One good sample of such a narrative tract writ large will be Heartwork – a collection of first-hand stories on the Economic Development Board (EDB), and of Singapore as seen through the eyes of former EDB officers who helped to write our island republic ' s economic success story.

In the context of the SAF and MINDEF, a re-telling of stories from Konfrontasi 1 , Operation Thunderstorm, SQ117 hostage crisis, MI185 recovery efforts, RSAF SAR operations, involvement in UN PKOs, INTERFET (East Timor), Operations Enduring Freedom (Afghanistan) et al as personally experienced by the soldiers and policy makers who were intimately involved in the range of crisis / contingencies / operations – large or small scale - may yet hold critical lessons that should not be forgotten but forever etched into the institutional memory of future generations of SAF soldiers. Even the more tragic – if no less heroic - chapters in SAF ' s history could be retold by those who actually went through their baptisms of fire and lived with scars to tell. Some of the painful stories may well make for gripping utobiographical case studies on core values and decision-making, with equally sharp lessons-learnt on safety / risk management. To be sure, good judgement is honed by learning from the mistakes or experience of others; albeit not forgetting the nugget of truth in the saying that "good judgement is usually the result of experience; and experience is frequently the result of bad judgement."

Downstream, the wider bandwidth of POINTER on the web could be exploited as an invaluable intellectual capital repository of organisational learning with virtual "living-links" for cross-generational professional dialogue and chat-room networking. And by providing another avenue to reachout and reachback, POINTER can indirectly play a part in keeping the alumni spirit of our military training institutions strong.

To be sure, for the sharing of personal perspectives and revelations to be of relevance and have a constructive impact on the SAF readership, POINTER's editorial treatment should eschew producing narratives of what Boey calls "the coffee-table genre" , where only official history gets represented. Voices from the margins of SAF's history also need to be heard. For all intents and purposes, views shared should ideally be reflective, generative or critical and revisionist even. Deep discourse and lively debates following on from such sharing of stories should be welcomed so long as they promote learning.

Such a bold signalling feature effort would be timely and a salutary addition indeed for the recently revamped POINTER. It recognises the value of our former soldiers by giving them pride of place and platform-of-choice in the journal to share their views and stories. The feature effort would also resonate with efforts to enhance our capacity to shape the future SAF by harnessing the tacit knowledge aspects of Knowledge Management and improving the quality of conversations aspects of Learning Organisation praxis. After all, an important facet of much of our Knowledge Management efforts at enhancing learning and leadership capacity in the SAF is about the transference of Cultural DNA and Organisational Learning through narrative / story-telling ala Dave Snowden's Cynefin story-telling project which we have embarked on. What better way then to capture and disseminate our very own military stories from yesteryear for the benefit of the scions of Singapore , many of whom will learn to bear arms in the service of the nation through the SAF. As LTG William M. Steele (ret) US Army had rightly advised in "The POINTER Conversation" interview of the previous POINTER issue: "Singapore must learn from its own experiences while being informed by the experiences of others."

Enough said. Beyond the POINTER platform, the respective Services may even find it worthwhile to compile and publish their own collection of stories from the past. On that score, there is certainly scope for the publication of true stories and viewpoints from the extended family members of the pioneering 1 st and 2 nd generation of the SAF Family...garnering pointers from the past for better foresight into the future before the old guard all fade away, as we all will someday. It would be a pity if we did not, while we still have time.

MAJ Irvin Lim Fang Jau

(Commanding Officer, RSS VIGOUR)

## Endnotes

1 As an example of where more revealing light could be thrown for gleaning useful lessons learnt: Reportedly, in

March 1965, a Singapore infantry battalion deployed to the southern coast of Johor was ambushed and involved in fighting against a small Indonesian force that was conducting guerrilla operations in the vicinity of Kota Tinggi.

# Viewpoints: Learning from the Past: An Old Soldier's Advice

Almost all those who were involved in the initial buildup of the Ministry of the Interior and Defence (MID) and Singapore Armed Forces (SAF) have retired. Indeed many, if not all, from the first batch of SAFTI had also retired. Many intakes of National Servicemen had also completed their National Service obligations. They have all brought along and taken with them many experiences and much learning.

Defence planners of all levels, in their enthusiasm to transform the SAF into a modern third-generation outfit, might need to make reference to the lessons of the past so that they can avoid the “blind alleys”. But this requires us to examine how we see these experiences and learning.

We all know that the past offers us the benefit of hind-sight. That makes the learning of history so important. The past provides insight into the future. We could have tapped into the wisdom of the many people who have left the organisation. While “old soldiers may fade, there is wisdom in that fading light”, and it requires the present and younger leadership to acknowledge and accept that such experiences are invaluable! The attitude and mindset that the experiences of the past may not be relevant today may be by itself the stumbling block.

How the current generation of SAF leaders at the different levels of command and staff value the experiences of the former military men is something that needs review. If we continue to treat former military personnel as merely guests for functions and to acknowledge them as “veterans” only in name, it will not lead to the sharing of experiences and learning.

To adopt a willingness to learn from the past requires us to be honest and humble and to appreciate the past. We need to inculcate in our officers a sense of history and adopt a set of values that can steer them in this direction. Some traditions, practices, doctrines, rules, procedures might have changed over time; yet we must have the humility to know that these have been there and the reasons for the change. These practices cannot be discarded and dismissed as being no longer relevant. They are relevant at that point in time. It is only when we see change, issues and practices in context that we can view our future as sustainable.

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# Book Review: Robert R. Leonhard's The Principles of War for the Information Age

by LTC Jimmy Mak

The Principles of War - defined as the fundamental truths governing the prosecution of strategy and tactics, these words immediately evoke a strong sense of immutability regarding the principles. Developed more than 100 years ago, it is amazing that the principles which were so true in the age of the sword and arrow still holds true in the age of computerised guided weapons. Its remarkable resilience has indeed guided many warriors throughout history, despite considerable changes in the character of warfare that has demanded a serious reassessment of the art of war. What was particularly disturbing was the used of the principles as aphorisms – as rules, as prescriptions in an unexplained blind acceptance way even when they were proven to be inconsistent. Many armed forces clung onto them irrefutably – choosing more often to force battlefield results to fit the principles, rather than to modify these ideas.

Acclaimed soldier and author Robert Leonhard's "The Principles of War in the Information Age" is a book that contributes to military education, as the latter is what you "rely upon when you face the unknown", in the words according to eminent educational philosopher and psychologist Dr Jean Piaget. In this book, Leonhard attempts to re-examine the classical principles of war since their early expression in the 19 th Century and questions their relevance in the era of the information age. He strongly suggests that a radical change is overdue, but regrettably military and civilian leaders are still trapped in their comfort zone concerning the character of future war. He emphasizes the urgent need to "break into the temple and smash a few idols" 1 if we are to summon the future with true conviction. However, given the way the principles of war have evolved in the past as a complete entity developed to address a set of problems related to warfare, it is not enough to change one or two principles. What really was required was a shift in paradigm thinking about the principles of war. With enormous energy and intellect, the author puts forth a strong thesis in the hope of generating serious and rigorous dialogue and debate; which in his mind will sow the seeds of change. His book is organised under the following parts:

The Framework for Change

The Principles of War (Existing)

The Laws of War

The New Principles of War

In Part 1 of the book, Leonhard begins his analysis by examining World War 1 where the loss of human life exceeded all bounds of proportionality. He explains that the underlying issue is one of change; with the introduction of technological advances into the military art which transformed it. But leaders in the war chose to cling onto classical manoeuvres and were convinced of the need for a prolonged attrition phase, which in reality was becoming inappropriate in modern war. He concluded that the failure of the generation of military leaders in WWI was their refusal to adapt quickly to change.

## **Principles of War (Existing)**

On to the existing principles of war, Leonhard highlighted that the US Armed Forces still persist to embrace the 9 principles of Mass, Objective, Unity of Command, Simplicity, Economy of Force, Manoeuvre, Offensive, Surprise and Security. Before setting out his argument, he first categorised the principles under a common logic 2 - the first 5 principles under the logic of convergence or oneness while the remaining 4 on interaction in war, between the enemy and friendly forces. He was bold in asserting that the principles of convergence are invalid in the Information Age. Additionally, he opined that the logic of oneness does not work in the 21 st century, and in many instances did not work in the past. However, he felt that the logic of interaction is still relevant, albeit the principles were poorly framed and consequently could lead to serious misinterpretation in the battlefield. The author recommends that even the principles of interaction need to be re-examined if they are to retain their worth.

Leonhard outlines explicitly what has changed concerning human conflict and warfare, which have brought about a mutation of the military art. After defining the Information age qualitatively, he attempts to determine the characteristics of Information Age warfare which is changing at an amazing pace. He cites examples of the

components that comprise Information-Age warfare such as command and control warfare, mass media, precision strike, precision protection and psychological ops. Before examining the existing principles of war, he wanted to discover for himself the extent to which knowledge and ignorance influence the modern warfare. To illustrate the potential effects of information dominance, he used a campaign from the past (The Maryland Campaign, Sep 1862) and analysed it from the angle of information flow, and concluded that it was truth or the lack of it that decided the outcome of the campaign. He laments that tactical leaders today are still schooled within the context that has characterised warfare in our age - where our plans, battlefield formations and tempo are founded upon ignorance of the battlefield - the fog of war as we know it. He posits that should our leaders be able to accurately and reliably “see the truth” on the battlefield, then our methods and practises must correspondingly change. The author asserts that information, truth and ignorance rule the battlefield and always had; and proposed that knowledge and ignorance will together constitute the central principle of war in the set of revised principles for the future. Armed with this vision of the future, he proceeds to examine each principle in turn to see how information can shed light on some of them in their current state.

Part 2 of the book covers Leonhard’s approach in the examination of each individual principles of war in turn where he sets out his argument on their validity in history and in the light of recent changes in warfare. Using the Principle of Mass (Concentration of combat power and effects at the decisive place and time) to explain the inconsistencies, he highlighted that in the days of the concentrated decisive battle, it made good sense to mass. In today’s context, the principle not only contradicts but is inconsistent with the other principles. Firstly, Mass violates the Principles of Security – given the lethality of today’s weapons of mass destruction, concentration would serve to invite annihilation. Secondly, Mass undermines the Principle of Surprise - a concentrated force is easy to find and difficult to hide. Last but not least, Mass contradicts the Principle of Manoeuvre – a massed force is difficult, if not impossible to sustain logistically for prolonged periods of time. He then examines the classical reasons why armies have sought to mass in the past, and concluded that those reasons do not apply in the 21 st century. He illustrates his point using the classical explanation of “mass equals killing power” 3 i.e. by concentrating combat power, the friendly force can kill maximum numbers of enemy weapon systems and soldiers. This logic rests on the fact that for most of human history, one man has been able to kill fewer than one of his enemies in battle (if we consider the inaccurate weapons used in the agrarian and industrial ages) and this limitation demanded a concentration of soldiers in order to overcome the incapability of each individual. Therefore to reliably kill an enemy, we need to have 2 or more friendly soldiers attack him, hence the principle of mass. But if we can envision the “one weapon, multiple kills” 4 potential future battlefield, we are likely to see the demise of the principle of mass.

### **The Laws Of War**

Leonard wrote in his preface his experience within the US Army and from his reading that he perceived a disturbing “unflagging devotion to traditional ideas, most of which are hopelessly and dangerously outdated. And what is worse – a seemingly reluctance even to question those ideas” 5 and the principles of war are no exception. In particular, he was concerned with the way they have been used – as aphorisms, as truths and prescriptions. The question we need to ask ourselves is if the principles are not aphorisms, are there any bona fide truths out there that are able to stand the test of time, that can survive revolutions in military art and science? Where is the real McCoy? Leonhard do believe there are 3 such truths, and he calls them laws, to connote their immutability. In Part 3 of the book, Leonhard demonstrates the validity of the laws throughout history, and argues convincingly their immutability on the basis that they are predicated on the one aspect of war that remains a constant - the human nature.

### **The Laws Of Humanity**

The 3 laws espoused are not equal with one another; there is one pre-eminent law, from which the other 2 grow. The first law, and the one that is independent of the others, is humanity - a declaration that warfare is an outgrowth of the human psyche 6; an expression of the human soul. This law is therefore the foundation upon which all other military considerations rest. If this is the law, the question we need to ask ourselves is why it has been continuously ignored by military art and science. One possible explanation is that there are more attractive alternatives to contemplate than moral factors. Another explanation and perhaps of more importance could be to avoid opening up a Pandora box that may reveal issues that challenge some of the deepest-held beliefs about war which has been framed around the fiction of attrition thinking. He ventured to explain that the current US war-fighting perspective premised on firepower does not work because of the law of humanity, because in reality we wrestle not against weapons, but against people, who are able to adapt - much like mutating diseases that adapt to antibiotics. Citing the repeated victories of Judas Maccabaeus and his followers – surrounded, out-numbered, ill-trained, ill-equipped Jewish farmers in ancient Palestine in second century B.C., when faced against the Syrian invaders, the world’s most powerful and trained professional army of their day, he concluded that it is the law of humanity that determined the course of that war, where attrition equation had no bearing on the outcome. He remarked that the humanity of

war should not be ignored but rather it is time for all armed forces to confront the problem face to face.

The other side of the moral perspective of firepower is the enemy's moral strength and weakness; and that defeat is 90% moral in nature. Given that we refuse to grapple with moral factors, we are unable to comprehend defeat of the enemy. Consequently, our energies are focused on destruction - the only alternative to defeat we know. In order to correct this deficiency, Leonhard called for us to focus on the human dimension – the weakness of the human mind and spirit in order for us to understand battlefield defeat.

From this one independent law of humanity grows 2 other laws – the law of economy and the law of duality. The law of economy is derived from the weakness of man - that man's desires and goals exceed his means. The law of duality has its origin in the human trait – the inclination of humans to be violent towards each other. Together, these 3 laws give rise to the principles of war (revised). Leonhard argues that since the laws ordain and acknowledge the most fundamental characteristics of warfare, it therefore provides a firm foundation upon which valid theory can then be built.

### **The Law Of Economy**

As iterated, the law of economy postulates that man is weak and lack resources to serve his goals in conflict. At the same time, given that the stakes are high in armed conflict, there is a natural tendency for the activity to be extremely wasteful. To prevail in conflict, Leonhard suggests that one must economise as much as possible. By extension, he put forth the proposition that if ignorance and uncertainty result in wastefulness; truth, knowledge or information will lead to a precise expenditure of resources i.e. to economise.

The author highlights that at the tactical levels of war, economy can be achieved by combining weapons and fighting entities in a complementary way. The focus is not on the lethality of each component, but on what battlefield reactions they can cause in the enemy. The law of economy calls upon us to bring about reactions in the enemy from which we can then exploit – as this book was published in 1998, the “reactions” referred to is akin to effects based operations we know today. Extending to the operational level of war, Leonhard maintains that the same dynamics applies but the tools are different. Just as combined arms is the key to economy and victory at the tactical level of war, operational war-fighting gives rise to joint operations, which calls for the effective integration of air, land and naval capability. The author acknowledges that integration is not easy to achieve as it requires tremendous effort in the aspect of organisation, leadership, training, education and teamwork. In his mind, the key challenge to jointery is inter-service rivalry; institutionalised due to inter-service competition for budget and weapons ownership or arising from the confusion between professionalism with loyalty to a particular service. Nonetheless, since the law of economy is the bedrock of successful conflict, and armed with more information in the future, it is only natural for us to economise. Therefore, the bringing together of combat capabilities of the services to develop joint war-fighting capabilities is clearly the way to go.

### **The law of duality**

The law of duality as espoused by the Leonhard is about the dual nature of human conflict that comprises 2 dichotomous parts - the subjective and the objective, which together constitute the totality of strategy. Subjective conflict is defined as the contest of strength against strength or fighting against “like” systems e.g. a tank shooting at another tank; while objective conflict pits strength against weakness or fighting against “unlike” and vulnerable aspects of the enemy e.g. a tank over-running an artillery piece.

Leonhard emphasizes the importance of having a thorough understanding of the subjective and objective phases and the dual nature of war, alluding that many errors in past military thoughts can be attributed to the failure to perceive the subjective/objective taxonomy. Conversely, if we are able to grasp the connection and relationship between the two, we will be able to harvest invaluable insights on other principles of war. Take for example “Mass”, we would immediately think that this is to be applied to warfare as a whole, but in reality it should only be to the subjective part. We must “unmass” to conduct the objective conflict. In essence, the subjective/objective taxonomy shows us the balance between the need for dislocation (an expression of objective warfare) and confrontation (subjective warfare). Therefore, at the heart of this law is the need to design weapons systems or fight in way that is directed against both like and unlike systems; which in essence is an essential part of striving for economy in war.

### **The New Principles of War**

In Part 4 of the book, Leonhard calls for the proper way to use the principles by treating them as arguments or as

categories of thinking. The author argues that the principles should be instructive in guiding the soldiers what to think, but not what to conclude. He envisages that future conflicts will be similar enough to past conflicts as to allow application of the laws and consideration of the principles; but those conflicts will also be unpredictable enough to require some imagination to be exercised on the part of the commanders who face them.

As iterated, the new principles of war are intended to frame argument, and therefore intentionally expressed as “2-word arguments” 8, representing the opposite sides of an argument, as likened to dialectic logic used in philosophy. The author suggests that the soldier of the future must be capable of talking to himself. He must learn to use dialectic logic - which begins in the 1st step with a thesis (a statement or proposition), an anti-thesis (extreme opposite) in the 2nd step and the final step being the synthesis (finding solution from a range of middle ground options or the bringing together of opposites). Leonhard emphasizes that this process is what the principles of war (revised) are designed to do. They are intended to teach you to argue about, with the end points of those arguments clearly defined. In his view, this discipline approach is a superior way to think on the battlefield and will invariably lead to far better conclusions than intuition or other forms of undisciplined thinking.

The 3 laws, when applied to conflict in the Information Age, give rise to 7 principles of war (revised), one of which is an independent principle, and 6 (categorised into 3 broad Principles of Aggression, Interaction and Control) which are dependent upon the first for application as follows 9:

Leonhard articulates that knowledge can be defined as the information that we have about ourselves, the enemy and the environment. Ignorance is the opposite of knowledge, and it deals with what we do not, cannot, or chose not to know. Both knowledge and ignorance have dominated warfare throughout history, but Information Age warfare has shifted the balance towards knowledge, in that commanders and soldiers in today's context are more aware of their surroundings than their predecessors in the past. Consequently, this will have a bearing on the application of the other principles.

The acme of skill in the Information Age is therefore to manage what we know and what we don't, and to balance our knowledge with activity. To illustrate, he explained that if time is not a constraint, a commander will eventually know everything about a conflict. However, because conflict is time competitive, one must choose to forgo knowing everything, and adapt his activity most efficiently to manage that ignorance. Leonhard qualifies that it does not imply that knowledge is good and ignorance should be avoided, but rather, we should understand that information has a cost associated to it i.e. truth on the battlefield costs time and perhaps even lives. Ignorance on the other hand, is free. In this respect, the principle of knowledge and ignorance is governed by the law of economy. According to Leonhard, knowledge and ignorance is the independent principle of war, upon which all other principles rely for application. That being the case, whatever balance we attain between knowledge and ignorance will affect the application of all other principles. To illustrate, he said that if we have great knowledge, we will tend more towards distribution than concentration, more towards activity than towards security, command than towards anarchy. Conversely, if ignorance triumph over knowledge in the battlefield, we will tend to favour reaction over opportunity, confrontation over dislocation, and objective over option acceleration.

In the concluding Part 4, Leonhard presents the new principles of war, which he asserts that when properly used as arguments rather than aphorisms, will serve as a dynamic framework for the development of creative solutions in conflict. He reminds readers that in conflict theory, the enemy will endeavour to adapt to any success. The principles, as robust as they seem, are designed to account for the phenomenon of adaptation and diminishing effects. To achieve this, the balance found among the 7 principles must be renewed and revalidated every day, in every battle. He reiterated that the principles are not substitutes for professional understanding and experience, but are mere heuristics - rules of the thumb that offer a quick access into the solution of a problem, not a complete solution in the military decision making process. In closing, Leonhard reiterated that these revised principles of war merely provide the framework - character and courage must ultimately create the victory.

## **Conclusion**

Robert Leonhard's reformulation of the principles of war in the light of the broader context of military history and the emerging potentials of the future is refreshing and daring. With his profound grasp of military history, coupled with his exceptional ability to conceptualise the future, Leonhard puts forth a compelling vision of the 21st century conflict.

The main strength of the book is the author's comprehensive and holistic treatment of the existing principles of war and his courage and ability to confront long-accepted convictions and refute deeply held convictions and concepts. The views presented are insightful and challenges the status quo in military thinking based on past conventions.

This book is a very useful read and is highly recommended for academics or practitioners interested in deepening their insights on issues pertaining to joint war-fighting and the principles of future warfare.

The abovementioned title is available for borrowing at the [SAFTI MI Library](#). The catalog references are:

The Principles of War for the Information Age  
Robert R. Leonhard  
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#### **Endnotes**

1 Robert R. Leonhard, The Principles of War for the Information Age, p.xii

2 Ibid. p.10.

3 Ibid. p.xiv

4 Ibid. p.102

5 Ibid. p.98

6 Ibid. p.208

7 "EBO is a co-ordinated set of actions directed at shaping the behaviour of friends, foes or neutrals in peace, crisis and war" - Edward A.Smith, Effects Based Operations - Applying Network Centric Warfare in Peace, Crisis and War.

8 Ibid. p.246

9 Ibid. p.252

LTC Jimmy Mak, a Weapons System Officer (Air Defence Artillery) by vocation, is currently Senior Air Force Directing Staff at the Singapore Command and Staff College. His previous appointments include Deputy Head of the Air Intelligence Department, Military Assistant to the Chief of Defence Force, and Commanding Officer of a Divisional Air Defence Artillery Battalion. He has also held branch head appointments in the Joint Plans Department. LTC Mak attended the Singapore Command and Staff Course in 1995 and graduated with a BSc (Hons) from the National University of Singapore in 1987

## Featured Author: Robert R. Leonhard

Lieutenant Colonel Robert R. Leonhard is the Professor of Military Science at West Virginia University and the Commander of the WVU Army ROTC Mountaineer Battalion. Raised in Camp Hill, Pennsylvania, he graduated from East Pennsboro High School in 1976 and earned an Associate of Arts degree from Valley Forge Military Junior College in Wayne, Pennsylvania. Commissioned as an Infantry officer in 1978, he graduated summa cum laude from Columbus College near Fort Benning, Georgia, with a Bachelor of Arts degree in History. In 1989, he earned a Master of Science degree in International Relations from Troy State University. In 1994, he earned a Master of Military Arts and Sciences degree from the Army's Command and General Staff College. His military education includes the Infantry Officer Basic and Advanced Courses, Bradley Infantry Fighting Vehicle Commander's Course, Airborne School, French Commando School, Command and General Staff College, and the Advanced Military Studies Program.

Leonhard served as a lieutenant in the 5th Infantry Division at Fort Polk, Louisiana as a rifle platoon leader, weapons platoon leader, company executive officer, and battalion motor officer. From 1986 through 1988, he commanded Company C, 1st Battalion (Mechanized), 6th Infantry in Illesheim, Federal Republic of Germany. Upon his return to the United States, he served as a combat developer at the Infantry School, Fort Benning, Georgia. During this time, he volunteered for duty in the Gulf War and served with 4th Battalion (Mechanized), 18th Infantry in the 3rd Armor Division. In 1994, he was assigned as the Operations Officer, 1st Battalion (Mechanized), 41st Infantry in the 2nd Armor Division at Fort Hood, Texas. He later served as the Chief of Plans, 4th Infantry Division. From 1996 through 1998, he served in the Joint Venture Office, Training and Doctrine Command at Fort Monroe, Virginia. Here, he planned and administered Advanced Warfighting Experiments – large-scale futuristic tests in information operations – for the Army's Force XXI program. His awards and decorations include the Bronze Star, the Meritorious Service Medal with three Oak Leaf Clusters, the Army Commendation Medal, and the Combat Infantryman's Badge.

Leonhard's first book, *The Art of Maneuver: Maneuver-Warfare Theory and AirLand Battle* (Presidio Press, 1992) is a critique of modern US Army doctrine, questioning its predisposition to Attrition theory at all levels of command. According to Leonhard, an over-reliance on obsolete attrition theory has limited, and in some cases come at a detriment to operational success – focusing on the tactical; at the cost of compromising strategic goals. He presents his alternative, Manoeuvre theory, and explores its foundation concepts: First, pre-emption, which is employing the element of surprise in acting before one's opponent can anticipate an attack. Second, dislocation, which is rendering an enemy's advantages irrelevant and neutralising his strengths. Leonhard shows us how these concepts in manoeuvre warfare can be employed to achieve the 'supreme excellence' of defeating the enemy without fighting, and does so with aplomb and apt analogy in a refreshing style, injecting examples throughout history ranging from Sun Zi to the Soviet Union.

Leonhard's next work, *Fighting by Minutes: Time and the Art of War* (Greenwood Press, 1994) takes a more theoretical approach in focusing on temporal warfare, and the application of temporal concepts and dimensions to all aspects of modern warfare. He laments the lack of time-sensitivity at all levels of command, and advocates greater priority on gaining "temporal asymmetry" by capitalising on the dynamic tradeoffs he identifies between mobility, offensive, and defensive capacities, and the time-sensitivity of these elements. Moreover, he employs these concepts in two strategies, delaying detection and hastening contact, showing us their applicability at all levels of warfare, and advocates the creation of a 'decisive echelon' able to implement these to ensure swift victory.

*The Principles of War for the Information Age* (Presidio Press, 1998) is Leonhard's latest and arguably, most ambitious publication, which builds on the ideas explored in his previous works. It is a critical re-evaluation of the classical principles of warfare, where Leonhard finds their relevance decreasing due to technological and cultural change and the advent of the Information Age, which necessitates revision of the core principles (Mass, Objective, Unity of Command, Simplicity, Economy of Force, Manoeuvre, Offensive, Surprise and Security). He proceeds to deconstruct each principle and show their obsolescence in information warfare. Working from first principles, he proceeds to offer his own three Laws of War, and from there a new set of principles as a framework for modern strategy – a highly original and ambitious effort.

A common thread links Leonhard's works: the inability of military theory and doctrine to recognise and catch up with modern developments in technology and warfare. Leonhard identifies these lags in doctrine, and advocates further exploration into the relevant issues to modern warfare, be it time-sensitivity, manoeuvre theory, or information warfare, and his works grow ever more ambitious in scope as he builds on the knowledge and ideas of past

publications. Future works from Leonhard will no doubt be a continuation of this trend, and we can expect even more critical assessments of the 21 st century military landscape.

# Personality Profile: Marshal Peng Dehuai

Peng Dehuai (1898 – 1974) was the Commander-in-Chief of the People's Volunteers Army in Korea during the Korean War from 1950 – 53. His forces repelled the UN coalition led by General Douglas MacArthur back to the 38<sup>th</sup> Parallel. His successful defence of North Korea is one of the main reasons for survival of North Korea and thus the continued partition of the Korean peninsula with all its strategic and security implications for the rest of the region and world. Drawing on the lessons of that conflict, he also pioneered the modernisation of the equipment, doctrines and professionalism of the People's Liberation Army (PLA). However, appalled by the suffering caused by the failed Great Leap Forward campaign and other radical policies, he came into conflict with Chairman Mao and this led to his eventual downfall.

Peng was born in 1897, in Hunan province (also Mao's province of birth) to a peasant farmer family of eight. Amidst the chaotic collapse of the Qing Dynasty, his early life of poverty and rural misery sharpened his social awareness. He experienced having to beg for food and worked as a menial labourer, construction worker and coal miner before enlisting in the warlord "Hunan army" at the age of seventeen. In 1922, he passed the entrance examination to the Hunan Provincial Military Academy and graduated in 1923, immediately returning to his old unit where he was appointed captain and unit commander. When the Hunan army broke with the Northern warlords and joined Kuomintang (KMT) forces, Peng became a KMT major and battalion commander. In 1928, he defected to the CCP and the PLA, where he commanded the PLA's conventional and guerrilla forces in the Sino-Japanese and Civil War for twenty-one years.

Peng's record as a military commander during both wars was mixed. Of the twenty-nine major battles that he personally directed, fifteen were victories. His most outstanding achievements were in battles for survival, such as the defence of Yen-an in 1947, and the battle of Shachiatien the same year – often considered to be the turning point of the war – where his forces saved Mao and the CCP Central Committee from capture. Mao even penned a poem in remembrance of Peng's contribution at Shachiatien:

*In high mountains, dangerous roads, deep pits, Cavalry rides length-wise and cross-wise freely in your command,  
Who dares to put the spear crosswise and draw the horse to a stop? Only our Great General Peng!*

His offensives, however, often went awry, such as the Pyrrhic victory of the "Hundred Regiments Campaign" against the Japanese in Northern China. In particular, Peng fared poorly against enemy commanders who were above-average strategists, such as KMT General Hu Zhongnan (from 1947 - 49), suggesting that while he was a good campaigner and tactician, he was, at best, an average strategist.

On 5 October 1950, he was appointed Commander-in-Chief of the People's Volunteer Army (PVA), which consisted of more than 400,000 battle-hardened PLA men. Peng's troops crossed the Yalu River into North Korea on 18 October, and engaged UN forces from one coast to the other across the length of the peninsula. In three campaigns, the PVA drove UN forces out of North Korea, crossing the 38<sup>th</sup> parallel on 31 December, and recaptured Seoul. However, Peng's victory had come at a high price. Battles were characterised by the infamous "human sea" or "human wave" tactics, which Peng invented and applied until mid-1951. These were bayonet charges by between ten and twenty waves of infantry, often made drunk on Kaoliang brandy, in the face of concentrated enemy fire, with insufficient artillery and tank support and virtually no air cover. Peng's fourth and fifth campaigns broke down, unable to break through enemy lines, and had to evacuate Seoul. The war came to a virtual standstill almost exactly along the 38<sup>th</sup> parallel. On 27 July 1953, Peng signed the armistice agreement at Panmunjom, and was awarded the title "Hero of the Korean Democratic People's Republic" by Kim Il Sung.

The Korean War strongly influenced Peng's military thinking. The high loss of life during the war convinced him that the PLA needed a complete modernisation of its equipment and training, as well as to move towards professionalism and modern combined operations. For example, the slow supply of Soviet weaponry and technology from Manchuria to the Korean front was due to the manual nature of Peng's logistics support force. It consisted of 700,000 coolies who shouldered 40kg loads in bamboo baskets, moving only at night to avoid US air power. They were eventually replaced by a modern supply-chain network of 7,000 trucks and 300 anti-aircraft guns. With the arrival of Soviet heavy weapons, Peng could employ position defence tactics, deploying a regimental artillery unit under each regular regiment.

In 1954, Peng was appointed Minister of National Defence, Vice-Chairman of the National Defence Council, Vice-Premier of the State Council, and First Vice-Chairman of the Central Military Commission – effectively becoming the

Supreme Commander of the PLA. Only three days after his official appointment, Peng started the modernisation of the PLA with his Order No. 1:

The Whole army must sincerely study the advanced experience of the Soviet army, grasp the art of modern warfare, bring to the fore revolutionary heroism, strictly obey orders, and honour discipline. Struggle to grasp and guarantee the victorious conclusion of each and every military task!

Peng enacted military reforms known as the “four great systems”: the compulsory military service system, the military rank system, the salary system, and the order of merit system. These reforms were approved and implemented in 1955. Many PLA leaders received the newly established orders of merit, Peng himself included. Simultaneously, rank insignia were introduced in the PLA, with new uniforms modelled on those of the Red Army made standard issue. Career soldiers now received regular salaries differentiated on an eighteen-grade scale. Commanders were also clearly above political commissars in rank.

Unfortunately, Peng’s reforms toward a more professional armed forces were a direct contradiction of Mao’s military thought since the early phases of the Civil War. Placing “revolutionisation” over “modernisation”, Mao stressed guerrilla warfare and militias as true to the revolutionary spirit of class struggle, as opposed to conventional and technical warfare with professional forces, and that political indoctrination in Marxist-Leninism should take priority over professional military training, and as such, political commissars should be as important or even more important as officers. Furthermore, Peng’s differentiated rank and salary systems smacked too much of bourgeois capitalism and profit-motivation, and undermined the egalitarian ideals of Marxist-Leninism. Mao launched his “people’s war” doctrine, mobilising hundreds of millions of civilians into militia units, which developed into a second armed forces controlled by the Party committees. This enabled Mao to deliver his ultimatum to split the CCP when confronted by Peng on the failure of the Great Leap Forward at the Lushan plenum in 1959. Peng was removed from his post and replaced by Marshal Lin Biao.

With the onset of the Cultural Revolution in 1966, Peng was arrested by the Red Guards, imprisoned, and tortured. His military career was painted as a series of failures, with his defeats emphasised as crimes of negligence or incompetence, and his victories either played down or attributed to personal direction by Mao. His praise of the Soviet army as a model for PLA modernisation was regarded as “clandestine connections with a foreign country” i.e. being too closely aligned with Khrushchev and “Soviet revisionism” during the Sino-Soviet split. As a consequence of repeated torture, he became seriously ill, and was transferred to a prison hospital in 1973. He received no substantial medical aid, presumably due to direct orders from Mao, and died 29 November 1974.

Peng was posthumously rehabilitated by the 3rd Plenum of the 11th CCP Central Committee in 1978. This reversal of CCP policy was as much a result of Mao’s death in 1976 and the subsequent re-evaluation of Mao’s cult of personality and a revision of his policies. Peng was an ideal symbol of opposition to Mao’s radical policies, and of pragmatic reformism – helping erode the power base of the Gang of Four and Hua Guofeng, and support the “Four Modernisations” of Deng Xiaoping and the reformists.

In conclusion, Peng’s contributions to history were not insignificant. Although he had his share of military blunders and defeats, such as at Kanchow, Kwangchang, Paochi and Kuangchung River Valley, it does not diminish the significance of his victories. Success at Shachiatien saved Mao and the CCP from capture, without which the PRC may have never been established. Similarly, his Korean campaign prevented the reunification of Korea and ensured the survival of the North Korean regime. His reforms, in contradiction to Mao’s ideas, laid the foundation for the PLA’s continued drive towards modernisation and professionalism.

His personal character won the loyalty of his officers and men as he was frugal, incorruptible, hardworking and courageous. However, he could also be extremely ruthless in service to his higher ideals and goals, sacrificing many lives in “human sea” attacks during the Korean War. He was forthright in his criticisms of the Great Leap Forward. This outspokenness was motivated by his desire to alleviate the suffering of the common people but also showed political naivety and in-sufficient skill in building the support he needed to translate these worthy sentiments into policy changes. As a result, he was unprepared for Mao’s counter-attack and only fully rehabilitated four years after his death. Even so, his military achievements and his integrity and courage at Lushan ensured that his name continued to command respect and even affection in the PRC.

## **BIBLIOGRAPHY**

Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (University of Kansas Press,

2004).

Jurgen Domes, Peng Te-huai: The Man and the Image (Stanford University Press, 1985).

David Rees (ed), The Korean War: History and Tactics (Orbis Publishing, 1984).