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The Bear strikes: Russian Army tanks entering Georgia in August 2008.
As you can see, the Army Journal has now made it as far as its third issue, and has so far only attracted compliments. But we want to go over to appearing quarterly from 2010, and that will not be possible if the officers and NCOs of the Army do not get down to writing for the Journal. You are professionals and professionals write about and for their profession. Look at the most effective armies in the world, and note just how many journals of various types they have. And note also that most of the articles in those journals are written by serving members. Why are we not doing the same?

This issue, like the previous two, contains a mix of articles on some widely differing topics. Take that as inspiration. To help you along some more, below are some areas that really need to be addressed.

The people involved in developing the SA Army Future Strategy concepts have done a remarkable job in laying the foundation for the South African Army of the future. It is now up to the serving officers and NCOs to take up the challenge and work out the details. You are the people who are going to be implementing that future strategy at the unit level, and you are the people who are going to be leading our soldiers in operations. That means it is you who must give thought to how this is all going to work in practice. That is an area in which it would be valuable if you were to put your thoughts on paper for others to consider and then to make their comments and suggestions. And that is what this journal is for.

One area that will require a lot of thought is the conduct – and support – of operations at the brigade and division level. The South African Army has a lot of expertise and experience at the battalion and battalion group level, but not at the formation level, so some reading and study will be required as well as thought. But it needs to be done if we are not to be caught out the day we have to run a brigade-level operation. Just one aspect: Who still remembers how to move the almost 2000 vehicles of a brigade from point A to point B without a series of monumental traffic jams? Is the Military Police being trained in the art of major convoy control? If not, who is?

At the more interesting tactical/operational level, how will the new brigade structures function on the typical road nets of southern Africa? Is the brigade large enough to be able to operate on two axes? Or is it simply too large to operate on a single axis? And how will a brigade, particularly with attached elements from other armies, function in those parts of Africa with even thinner, and vastly less well-maintained, road nets?

There is also the question of how to optimally group and train mechanised infantry. Is it really a branch of the Infantry? Or is mechanised infantry more akin to a larger and more powerful version of the old support troop of the armoured car regiment? Should it not be grouped with the Armoured Corps for training purposes, or even transferred to the Armoured Corps? And, of course, can mechanised infantry mounted in Badgers actually fight with tanks? Or do we need a heavy ICV on a tank platform giving the same level of protection to enable them to actually move with the tanks? Some other armies are beginning to move in that direction, so we need to think about it.

There is also the matter of urban operations. Is that really something that any infantry battalion can handle? Or is that something for which specialised equipment and training, and perhaps even a different organisation are required?

And moving onto something really different, we need to give some very serious and ‘out of the box’ thinking to the employment of the future Contingency Brigade and how it will employ its units. There are those in the airborne forces world who believe that they can handle sea-landed operations on the basis of their existing experience. That is delusion: Sea landed operations present challenges and complexities that are very different to any other form of operation, and those need to be thought about, and thought through, now, before we begin to organise the units, buy the equipment and write doctrine.

The new engineering capability in the Army also requires some thought if we are to be able to make optimal use of it. There is talk of “developmental peacekeeping”, but how much thought has been put into it. What are the ways in which the South African Army’s units can help the local population in the areas to which they are deployed as part of a peace support operation? More to the point, what are the most effective ways to help those people stabilise their future?

Finally it is well past the time that we gave serious thought to an incentive system for the Reserves. It is self-delusion to imagine that the existing system can survive for any reason other than our high unemployment rate. If we want to attract and retain the best people, we are going to have to present them with an incentive system that takes service in the reserve beyond something that is done out of personal interest or even a sense of doing something for the country, into something that also holds benefits for the soldier’s family: That family has to put up with the soldier’s absence on evenings, over weekends, for several weeks during routine training, and for several months for a peacekeeping deployment, and it has to do so without the benefits that accrue to the families of Regulars. That needs to be addressed. The United States is one of the very few countries that has a reserve system that works, and they have a saying that, “your recruit the soldier; you retain the family”.

EDITORIAL
Are we on the information highway?

Colonel Andre Retief

The so-called “Information Age” has overtaken us. No serious institution anywhere in the “whole wide” world can afford not to be on the “Information Highway”. No serious institution can afford not to exploit the World Wide Web (Internet) optimally. Is there any serious institution without a Website? Is there any professional person out there without an email address? The modern world is rushing ahead on the Information Highway and the speed is increasing as you read this. Out there, new information technologies are overtaking even each other and massive capabilities are available to every institution and individual prepared to jump on the Information Highway.

Now let us ask ourselves: Does the SA Army exploit these capabilities? Are its members benefiting from the available technologies of this age? Are we all not extremely reliant on modern technologies to execute our various missions and tasks in this “Information Age”? Are we users of technology or have we missed the boat?

The Internet holds many benefits for the SA Army. We should at least take note of the following two:

• Development of our people.
• Effective Command, Communication and Control.

All major enterprises, and most certainly the SA Army in its Force Preparation Role, should always endeavour to develop and empower their people (their most valuable asset) to be most effective. Most effective in the 21st Century, the Information Age!

During the continuous development and empowerment (ETD) of an institution’s people, the successful enterprise should focus on exploiting modern technologies and preparing them for the Information Age. Preparing them to at least survive in the Information Age, but ideally to maximise the benefits of the Information Highway!

All major enterprises, and certainly the SA Army, require many Command, Communication and Control (C3) activities in their day-to-day management. Plans and programmes need to be developed, orders and instructions given, feedback and status reports required. Any major enterprise requires access to data, information and situation reports (SITREPs). They require managerial information, databases and maximum information to improve their “situational awareness” and get the overall “picture”.

We need to ask ourselves if the SA Army is still relying on outdated, redundant, slow and costly measures to “get the picture” and control the outcomes. Examples in this regard may be letters, orders, instructions, postal services, couriers and hand delivery, even faxed documents. We need to ask ourselves if we can justify our immense telephone account, of which much goes towards faxed documents and confirming correspondence that did not reach the addressee in time.

Is the SA Army exploiting the opportunities available in this “Information Age”? How many of our members have access to this technology and the available information? What percentage of our members has access to the internet? How many of our members have an email address?

Are we recognising and understanding the massive potential benefits of full-scale access to the Internet and exploitation thereof?

Of paramount importance is the development and empowerment of our people to thrive in the Information Age. It may be argued that development will almost happen spontaneously if all soldiers have easy and unrestricted access to the Internet. Such access will automatically allow all soldiers

• To access the vast sources of information available online.
• To access online newspapers and related news media services.
POINT

• To access online encyclopaedias with all the information there.

• To access online maps such as Google Earth and the obvious benefits of map information for soldiers.

• To access free online telephone services (VOIP) such as Skype or many others.

• To access free online messaging services and email, which could improve our communication dramatically.

• To access training programmes of our military training institutions for online training (distance education).

Access to the Internet alone will spontaneously assist directly to develop and empower our people. It will keep our people informed and educated. There will, however, be tremendous further benefits and savings for the SA Army.

By implementing readily available access to the Internet for all soldiers, the SA Army stands to gain at least the following benefits:

• Our people will be empowered and developed with access to information.

• Improved communication between decision makers and role players will be possible and facilitated.

• Massive savings on telephone costs.

• Massive savings would be effected on paper, fax and signal distribution techniques.

• The C3 system will be boosted with rapid and effective feedback and SITREPs. Rapid dissemination of information and instructions will also be possible.

• Since there will be fewer documents posted and couriered (“manhandled”) much more advanced security of information may be possible.

Now, of course, many will argue that the Internet has enormous security challenges and threats. Is that really true or just and excuse? How do all the banks in our country manage to effect secure internet banking transactions for all their millions of clients on a daily basis? How do modern companies do business to the tune of billions of dollars daily? How does the South African Department of Foreign Affairs securely communicate with all their embassies in foreign countries? Where appropriate the communications must be secured. As simple as that! But to prevent all access to the Internet, and the reaping of all the benefits it entails, based on security concerns, is just not logical.

CONCLUSION
Can the SA Army of today (and for 2020) afford not to have unhindered access to the Information Highway in the Information Age? Can we really progress without unhindered access to the Internet?

Can we really facilitate the development and empowerment of our people, and the day-to-day C3 and management of our Force Preparation role, without the implementation of unhindered Internet access to all our people?

It should be clear that access to the Internet with a modern, effective, computer based information and communication system will, if implemented, empower our people and prepare them for the Information Age.

The SA Army Leadership will also have far better situational awareness, more accurate data at its disposal for decision making and speedier and more secure ways of disseminating orders and instructions.

We can scarcely afford not to make every effort to stop being dinosaurs in the Information Age? Should we not therefore get onto the Information Highway and speed into a successful future? ♦
The importance of future planning for the SA Army

Major Evert Jordaan

“The future falls prey to demands for short-term clarity that erode our ability to properly study and understand it… Those involved in defence and military policy decisions must harness existing thinking and theory-building on military futures if they are to understand and make informed decisions about difficult and potentially destructive future scenarios.”

- Dr Francois Vrey, Foresight, 2001

Background
The Russian outlook that military science is the science of future war, created a mindset that spurred prominent breakthroughs in military theory, doctrine and technological advancement during the 20th century, for example Tukhachevsky’s Deep Operations doctrine and Ogarkov’s work in promoting a military-technical revolution. Currently the Peoples’ Republic of China is the most dominant non-Western actor involved in military futures on how its armed forces should reorganize for expeditionary tasks to come to terms with possible future war. Being future-orientated is critical to avoid stagnation and maintain an innovative defence force. The aim of this short paper is to highlight the importance of planning towards the future for the SA Army, as well as to suggest some pointers to achieve this.

The Possibility of Planning for the Future
Although the future holds much uncertainty, planning for the future is possible if relevant future trends are extrapolated to form a more-or-less clear picture of the next few decades. Scenarios are also valuable. An understanding of the features and implications of alternative long-term futures in Africa, from a South African perspective, holds much value for the SA Army. Planning for the future is to develop and present alternatives that normally depict optimistic alternatives. These alternatives should, however, be scrutinised and refined to ensure a relevant future perspective for the formulation of guidelines to build a flexible SA Army for the future.
**Reasons for Future Planning**

A thorough effort to formulate sound strategy has an inherent utility to achieve what is required in future. There are several reasons why planning for the future is necessary for the SA Army. Firstly, the pace at which change in the global security environment is taking place has become revolutionary in nature and the complexity of warfare has also increased through the wider spectrum of expected roles and the humanitarian and legal constraints on the use of military forces. This pace of change brings about a proliferation in alternative futures and scenarios. For example, South Africa’s involvement in African peace missions since 2000, across the spectrum of conflict in support of the African Renaissance and NEPAD (New Partnership for Africa’s Development). Another example is the increasing prominence of community wars in Africa and humanitarian disasters which threaten the configuration of conventional militaries in Africa. Rapid changes call for rapid responses and the strategic environment is no exception. Therefore, as institutions that operate in a fast-changing strategic environment and are known to change slowly in order to maintain operational equilibrium, armed forces need to probe and investigate alternative futures. (Manzini expressed this as something along the lines of “The faster you drive into the dark – the stronger your headlights (must be) to see further ahead”.

Secondly, the SA Army must break its historic tendency of being unprepared for the next military challenge. The South African military was caught unprepared in 1914, 1939, 1975 and 1998. On each occasion unforeseen wars and operations in Africa’s diverse climates and terrain meant that its equipment and doctrine were outdated, and that experience was gained the hard way – on the battlefield. Currently the SA Army is struggling to provide cohesive units and sub-units, as well as logistical support for expeditionary missions in Africa. In addition, the SA Army still neglects essential aspects, for example: sufficient operational reserves and support in the form of logistics, doctrine development, in-depth training for peace missions, and orientation for urban, jungle and desert operations. This poses unnecessary risks for SA Army members deployed in conflict “hot-spots” such as the eastern DRC and Sudan. The SA Army therefore has much catching up to do, and must perhaps project itself into the future (leapfrog) to also remain in step with its future challenges in Africa.

With Vision 2020 the SA Army has gone through an extensive process to evaluate the external and domestic environments to establish a relatively good understanding of the future challenges in Africa. Through this learning experience the SA Army has realised that correcting current mistakes and preparing for the future at the same time, is an extensive task that requires champions, thorough fact-finding and research, staff work, coordination and creativity.

**Principles for Future Planning**

Obtaining a general, long-term outline of the future security environment and its challenges is very difficult in contemporary times. Defence forces that introduced successful military innovation and organisational change during peacetime, applied a few key principles to meet future challenges.

Firstly, they evaluated the future character of war/operations very accurately, and did so on a continuous basis. This enables one to monitor trends and new developments. Senior officers must react to the structural changes in the security environment, rather than current intelligence, to formulate future plans. Usually structural changes provide more enduring indicators than intelligence.

Secondly, the general rule for military innovation is not to focus on budgets when trying to understand or promote innovation. Modern case studies indicate that initiating innovation and bringing it to the point where it provides a strategically useful option, has been accomplished when budgets were tight. The implementation of military innovation, however, is expensive. During peacetime military budgets are tight but time is less constrained, while during war military budgets are more accessible but time severely constrained.
Thirdly, to introduce sound reforms senior officers need to formulate a strategy (refined and scrutinised by experts) that addresses the intellectual and organisational components of organisational change. The intellectual side refers to the continuous evaluation and improvement of doctrine, concepts, experiments and exercises to ensure the relevance of the SA Army’s thinking and training (the software for operations). Innovation and the constant development of doctrine and training methods require open debate by soldiers and civilian experts to refine ideas. Intellectual developments must then be supported by the necessary structural changes and equipment (the hardware) with all its implications. This requires thorough planning to ensure that new reforms can be implemented in time with the necessary means.

Lastly, response to the changing nature of the security situation must also be accompanied by changes in the senior officer corps, which controls innovation. Studies in peacetime military innovation showed that when senior military leaders (with traditional credentials) could attract (and promote) talented young officers with great potential to conduct a new way of war, they were able to build new, usable military capabilities. The SA Army must therefore recruit dynamic people and create a new promotion pathway for junior officers to contribute to ways and means to conduct a new way of complex warfare. The SA Army requires dynamic leaders promoted into leadership positions to move the SA Army beyond the status quo, allowing new ideas to slowly diffuse along theoretical lines, interest groups, experimentation and exercises and finally into doctrine. The SA Army must empower its junior ranks to meet these challenges; the future of the organisation depends on it.

Conclusion

The formulation of sound strategy for the future is crucial for the SA Army as a whole to break the general tendency of being unprepared for future challenges in Africa. Preferred alternative futures need to be demarcated. A future perspective cannot be achieved if one is blinded by the magnitude of current problems such as budget restrictions and manpower issues. Therefore, a dedicated civil-military futures think-tank to advise senior military decision-makers is an option. In this way a futures orientation can co-exist alongside that of dealing with the status quo. The SA Army’s future success will depend on a continuous analysis of structural changes in the future security environment, as well as the implementation of strategies and plans to address future and current problems. Furthermore, a particular emphasis should be placed upon recruiting, preparing and maintaining the future military leaders who must take the SA Army forward. ♦

ENDNOTES

1 Maj Evert Jordaan is a member of the South African Armoured Corps and works as a project officer on SA Army Vision 2020.


iii Ibid.


v F. Vreÿ, op cit, p 213.

vi S.P. Rosen, op cit, p 252.


viii Electronic correspondence with Dr F. Vreÿ, Lecturer in Military Strategy, Faculty of Military Science, Stellenbosch University, 12 July 2006.

The views and arguments expressed in this paper are those of the author and not the official views of the SA Army or the broader Department of Defence.
CURRENT AFFAIRS

The Georgia conflict of August 2008: Exponent of Russia’s assertive security policy

Marcel De Haas
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In August 2008 Russia fought and won a five-day war against Georgia. This short conflict fits into Moscow’s increasing assertive security policy of recent years. Under President Vladimir Putin Russia unfolded an anti-Western stance, condemning NATO expansion, unilateral and dominating policies and the deployment of a missile shield. Furthermore, Moscow wants to remove the ‘Cold War vestiges’ of the current European security architecture and has suspended the Conventional Forces in Europe (CFE) Treaty. This forceful posture has been combined with demonstrations of military force. For instance by threatening European states involved in the US missile shield program, by resuming strategic nuclear bomber flights, by conducting naval exercises in the Atlantic Ocean and the Mediterranean, by re-installing the traditional military parade on Red Square, and by starting or resuming military cooperation with countries ‘hostile’ to the West, such as Libya, Syria, Cuba, and Venezuela. Russia’s warfare against Georgia – considering that the foundations for this armed struggle had been visible for a longer time – was part and parcel of Moscow’s assertive security politics. After providing an essentially military analysis of the Georgia conflict, the article continues to elaborate on the consequences of the conflict for Russia’s military thinking. Related new Russian conceptual thinking in foreign and security policy, as revealed just before and since the Georgian conflict, also needs to be discussed. Furthermore, whether connected to the Georgia conflict or not, since August 2008 Moscow has launched a huge ‘offensive’ in re-armament programs that should bring its armed forces in line with Russia’s self-perceived return as a superpower.

The Russian-Georgian conflict (7-12 August 2008)
After days of shooting incidents between the de-facto South-Ossetian armed groupings and the Georgian armed forces, in the late evening of Thursday 7 August Georgian President Saakashvili ordered his troops to return law and order and
Tbilisi’s rule in the rebellious province of South Ossetia. Considering the speed with which the armed forces of Georgia and of Russia brought in troops, it was clear that both parties had prepared for an armed clash. The following day Moscow sent reinforcements from North Ossetia into South Ossetia and responded fire. Also on 8 August Russia’s air force started attacks on targets in Georgia proper, i.e. outside Abkhazia and South Ossetia. During the weekend Russia further increased its military force against Georgia. Its Black Sea Fleet disembarked 4,000 troops in Ochamchire, Abkhazia, and started a maritime blockade of Georgian ports. After the troop build-up was considered at a sufficient level, on Monday 11 August Russian forces invaded from South-Ossetia and Abkhazia into Georgia proper. The Georgian armed forces were no match for the huge Russian potential of troops and arms and were forced to withdraw. On 12 August Georgia and Russia agreed on an EU-brokered cease-fire, the so-called ‘Six points peace plan’. However, from 12-22 August, in spite of the armistice, Russian forces continued military operations in Georgia. On 22 August Russia withdrew its military forces from Georgia proper without those that remained in so-called buffer zones south of Abkhazia and South-Ossetia. Russia justified the continued occupation of Georgian territory upon point five of the Medvedev-Sarkozy peace plan: ‘Prior to the establishment of international mechanisms the Russian peacekeeping forces will take additional security measures.’ A few days later, on 26 August, Russia recognized the independence of Abkhazia and South Ossetia. In a successive round of negotiations between the French President Sarkozy, on behalf of the EU, and his Russian counterpart Medvedev, Russia agreed to pull its forces out of the buffer zones by 10 October, which simultaneously would be replaced by more than 200 observers of the EU. However, Russia denied access of the EU-observers to the regions of Abkhazia and South Ossetia. Next, Russia decided that it would keep 7,600 troops permanently stationed in South Ossetia and Abkhazia; and will set up military bases accordingly. International talks on the conflict, corresponding with point 6 of the peace plan, commenced in Geneva on 15 October 2008, but so far have not resulted in a settlement of the disputes.

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<tr>
<th>Figure 1: Comparison of forces²</th>
<th>Georgia’s Armed Forces</th>
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<tr>
<td><strong>Russia’s Armed Forces</strong></td>
<td><strong>Georgia’s Armed Forces</strong></td>
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<tr>
<td>1 million personnel</td>
<td>25,000 personnel</td>
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<tr>
<td>23,000 tanks</td>
<td>183 tanks</td>
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<tr>
<td>25,000 armoured combat vehicles</td>
<td>134 armoured combat vehicles</td>
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<tr>
<td>26,000 artillery pieces</td>
<td>238 artillery pieces</td>
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<tr>
<td>1,736 combat aircraft</td>
<td>9 combat aircraft</td>
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<tr>
<td>635 attack helicopters</td>
<td>9 attack helicopters</td>
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<th>Russia’s North Caucasus Military District</th>
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<tr>
<td>90,000 personnel</td>
</tr>
<tr>
<td>800 tanks</td>
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<td>2,000 armoured combat vehicles</td>
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<td>900 artillery pieces</td>
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<th>Figure 2: Russian targeting of Georgia’s order of battle⁸</th>
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<td><strong>Location</strong></td>
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<td>Poti</td>
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<td>Senaki</td>
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**CURRENT AFFAIRS**

Russia’s military build-up and comparison of forces

Some sources claim that Russia had prepared for war already years ago, but in spring 2008 evidence for such an assumption became stronger. In April Russia deployed more than 1,000 additional troops to its – formally ‘CIS’ – peacekeeping force in Abkhazia, which until then consisted of some 2,000 soldiers. As of April Russian military aircraft regularly violated Georgian airspace. The most striking example was a Georgian drone, which provided footage of being attacked by a Russian fighter, just before it was shot down. In May/June Russia deployed its so-called Railway Troops to repair railway tracks in Abkhazia, which during the conflict were to be used to transport reinforcements from Russia to the battlefield in Georgia. Moreover, on 10 July the commander of Russia’s North Caucasus Military District (NCMD) stated that his troops were exercising for possible intervention in Abkhazia and/or South Ossetia. At the end of July the NCMD conducted exercises near Georgia’s border including its 58 Army. This formation would subsequently act as the key player in the armed conflict with Georgia. In late July ships of Russia’s Black Sea Fleet, involved in the same Kavkaz-2008 exercises, did not return to their port and later also contributed in the Georgia conflict. The gradual build-up of Russian armed forces in the months prior to the conflict explains the rapid pace with which Moscow was able not only to counter Georgia’s invasion of South Ossetia, but also to conduct land, air and naval operations simultaneously and all over Georgia.

The question remains whether Saakashvili realized that by invading South Ossetia he would be confronted with Russia’s military power. A comparison of forces between both combating parties makes it clear that the Georgian armed forces did not have any chance in defeating Russia’s army (see Figure 1). Of course the discrepancy in numbers has to be regarded with due reserve, since Moscow did not conduct warfare with the whole of its armed forces. Nevertheless, the difference in military capabilities is striking. Even if we limit the comparison of forces to those of the NCMD, the adjacent Russian area from which most reinforcements of troops and arms came from, the superiority of Russia’s military power over that of Georgia’s is still evident.

Russia’s strategic objectives and military targets

During and after the armed conflict the leaders in the Kremlin made it quite clear what their intentions were towards Georgia. Russia’s political-strategic goals were

- to prevent Georgian authority over the separatist regions of Abkhazia and South Ossetia;
- regime change, to remove Saakashvili from office;
- to prevent Georgia and Ukraine from joining NATO;
- to demonstrate to the West that it has no access to Russia’s former Soviet sphere of influence;
- to discourage the success of alternative pipelines aimed at diminishing Russia’s energy dominance;
- and to show to the world that Russia is back as a key player in the international arena which will influence its agenda.

Moscow’s political-strategic objectives were translated into the following military-strategic goals. After neutralising the Georgian armed forces, by installing buffer zones south of Abkhazia and South Ossetia and consequently occupying vital transport lines and locations, Russian forces could easily control the major part of Georgia’s territory in case of a return of violence. Perhaps Russia also anticipated that by partly occupying Georgia this might entail an internal revolt against Saakashvili. Subsequently, military-strategic goals resulted in military-operational targets. The targeting by Russia’s land, sea and air forces coincided with the order of battle of Georgia’s armed forces (see figure 2).

Russian conduct of warfare

In their operations the Russian troops used massive artillery and aircraft barrages in stead of precision targeting. Furthermore, Russian soldiers were seen sitting on top of their armoured personnel carriers because traveling inside - due to insufficient armour - was more dangerous. Close air support for ground forces was hardly witnessed. Moreover, between four and eight Russian aircraft were shot down by Georgian air defence, which was not-destroyed prior to the offensive. It is known that Russian air force pilots, especially those of fighters and bombers, have a lack of flying hours. As a result of this low level of training but also due to a disproportional use of force in stead of precision guide munitions (PGMs), much collateral damage was caused. Next, it was astonishing to see that the Russian military captured all Georgian arms and equipment that they could find to transport them back to Russia, apparently to use it themselves.

The Russian way of warfare in Georgia clearly gave evidence to the fact that the units involved were either not equipped with PGMs and other high-tech weapons or were not capable of using them properly. Furthermore, a lack of combat-ready trained personnel was obvious. The losses of aircraft were

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The Russians used heliborne troops to seize key points and as mobile reserve forces.
caused by insufficient aerial reconnaissance and other intelligence gathering. The coordination of action among the services (army, air force and navy) also failed. Although after the fiascos of the Chechen conflicts conceptual approaches were launched to increase coordination and to conduct joint warfare – in particular by creating joint-style regional military commands to replace the mainly single service military districts – military action in this conflict was still carried out by way of the long-established structure of command and control. Consequently, the Russian armed forces conducted in Georgia old-fashioned instead of high-tech and non-contact operations, i.e. the modern (Western-style) of warfare. They won the war by using the traditional Russian/Soviet concept of warfare: an overwhelming use of arms and troops.

Status of the Russian armed forces and military thought
The performance of the Russian military in the Georgian campaign should be considered in the light of the current conditions of the army and also as part of the existing military thinking.

Arms and personnel
A large part of Russia’s weaponry is obsolete. In the Georgian conflict this was demonstrated by soldiers sitting on top of infantry carriers with insufficient armour and by the fact that Georgian arms were looted. The level of investment earmarked for purchasing new hardware has been too low. The share of modern military hardware is allegedly only 10-20 percent of the total. The amount of arms and equipment becoming obsolete is growing faster than the numbers purchased to replace them. For example, from 2000-2004, the army added only 15 new tanks to a total of 23,000 pieces. As to human resources, the social circumstances of military personnel are poor. Salaries and pensions make living conditions hard and cause an increase in suicides among the military. In addition, Russia’s military suffers from severe conscript desertion, mainly due to hazing, a shortage of qualified officers, low levels of motivation, corruption, and a lack of training, resulting in insufficient combat readiness. The Kremlin has maintained that the total size of the armed forces -- around one million soldiers -- will not be subject to radical cuts and conscription will be continued. The bad reputation of the army (hazing, Caucasian conflicts, low salaries) and a declining population have been obstacles for finding the required amount of contract soldiers.

Attention for asymmetric warfare
In October 2003, then Minister of Defence Sergei Ivanov published a defence whitepaper, The Priority Tasks of the Development of the Armed Forces of the Russian Federation.
CURRENT AFFAIRS

In this document an analysis of recent Western-led conflicts and Russia’s own experiences in Chechnya led to the conclusion that irregular warfare had become a priority for the military. However, the observation that modern, specifically irregular, warfare can only be fought with sophisticated weapon systems, such as PGMs and avionics that provide all-weather capability, and by improving the training level of personnel, required financial means. So far, reform plans did not aim at fulfilling these requirements to an adequate level. Moreover, this document demonstrated contrasting entries in Russia’s threat perception, by mentioning irregular conflicts but also still emphasizing large-scale warfare, i.e. against NATO, as main threats. Russia’s generals also regularly gave proof of their ambiguity in threat conception. Sometimes they mentioned modern day threats such as organized crime, drugs and arms trafficking, illegal immigration, extremism, separatism and terrorism as priorities. But at the same time traditional Cold War vestiges of threat perception, such as the expansion of military blocs, military presence in regions traditionally of Russian interest, ignoring Russia in international security politics, and moves against the strengthening of Russia as one of the influential centres in the world, were also stated as major threats.

Military thinking

In the defence whitepaper of 2003, Russia focused on modern high-tech warfare and on asymmetric conflicts, instead of largescale conventional wars. However, unless the current large-scale structure of the armed forces is changed, the adaptation of the armed forces to modern warfare is likely to be obstructed. Military exercises and the Georgian conflict demonstrate that Russia is capable of handling conventional warfare, but in a traditional way. Until now there were no indications that the armed forces are trained and equipped for wide-ranging, complex military operations abroad, which these days is the core business of Western military power. So far the Kremlin refrained from radically changing the structure of the armed forces toward one which is capable of addressing the challenges of modern warfare and current threats. However, Russia’s global ambitions – as described below – demand the capability of power projection by highly skilled, modern-equipped, expeditionary military forces that can be deployed at short notice anywhere in the world. At the same time, protracted conflicts in the North Caucasus demand armed forces capable of conducting asymmetric warfare against an irregular opponent. As yet, the conditions of Russia’s military and its future reform plans did not live up to these two demands for the armed forces.

New security thinking and corresponding military reforms

In July 2008, a new edition of Russia’s Foreign Policy Concept was published, President Medvedev’s first security document. Major entries in the document are:

1. Primacy of international law;
2. The world should be multi-polar; not single-pole; no domination, such as by the USA;
3. Russia has no intention of isolating itself, seeks friendly relations, also with the West;
4. Protecting Russians wherever they may be is priority. Russia responds to any aggressive act against them or Russia;
5. Russia has privileged interests in certain regions.

In addition and related to these new concepts on security policy, in autumn 2008 the Kremlin launched radical plans for modernization of the armed forces. The reforms entail...
cutting the number of officers from the current 30 percent of the total manpower to 15 percent by 2012. Furthermore, a restructuring of the strategic- and operational-level command-and-control structures was announced. The current system of military districts, armies, divisions and regiments will be replaced by a structure of military districts, operational command units, and brigades. Each military district will have an airborne brigade as a quick-reaction operational-level unit. Based on the experience of the Georgian conflict, these units will be used to accomplish operational-level tasks with high precision and in a matter of several hours. In addition to this, and also with reference to the Georgian conflict, a rise in the defence budget for 2009 of some 25%, and large procurement programs – to replace 30% percent of the old weapons within five years and more than 80% by 2020 – were also made public.

Conclusions

Although a victory for the Kremlin, the Georgian conflict clearly demonstrated shortcomings in the capabilities of the Russian armed forces. The Georgian conflict is part of a consistent assertive stance in Moscow’s foreign and security policy, of which military power is one of the major instruments. Around the military campaign in Georgia President Medvedev launched new policy concepts, emphasizing Russia’s return to a position of strength. After the conflict the Kremlin concluded that the military should be brought in line with this status. Thus, ambitious reform and procurement plans were announced. For a number of reasons it is doubtful whether these plans will be carried out. First, for many years the armed forces have been faced with reforms which were not established, either by obstruction of the generals or lack of political will. Secondly, although Russia’s defence budget has risen rapidly since 2001, there is no considerable improvement of combat readiness of the forces. Often, money disappears into the pockets of corrupt officers or is used inefficiently. Defence Minister Serdyukov, a former tax official, was nominated for this post by former President Putin especially to counter corruption and obstruction by the military leadership. Thirdly, Russia is suffering heavily from the international financial crises, to an extent that the financial reserves built up by oil and natural gas revenues are fainting away rapidly. Money might be needed more to avoid social unrest than to invest in military power. However, if the Kremlin maintains its military ambitions and is capable of realizing them, then the West, confronted with a resurgent Russia, might have to change its defence plans into those in which collective defence has once again a central focus.

REFERENCES AND FOOTNOTES

1. There are also claims that the other side started the conflict. Georgia’s invasion was allegedly in reply to South Ossetian attacks on Georgian villages, which triggered the conflict. See: ‘Eyewitness accounts confirm shelling of Georgian villages’, RadioFreeEurope/RadioLiberty, 14 November 2008; Another source claims that Russian reinforcements were already in South Ossetia on 7 August 2008 (‘Soldaty govoryat’, polit.ru, 10 September 2008).
2. The Medvedev-Sarkozy 6 points armistice plan comprised: (1) No resort to the use of force; (2) The absolute cessation of all hostilities; (3) Free access to humanitarian assistance; (4) The Georgian Army must withdraw to their permanent positions; (5) The Russian Armed Forces must withdraw to the line where they were stationed prior to the beginning of hostilities. Prior to the establishment of international mechanisms the Russian peacekeeping forces will take additional security measures; (6) An international debate on the future status of South Ossetia and Abkhazia and ways to ensure their lasting security (‘Press Statement following Negotiations with French President Nicolas Sarkozy’, 12 August 2008, kremlin.ru, http://www.kremlin.ru/eng/speeches/2008/08/12/2100_type82912type82914type82915_205208.shtml.
4. According to Andrei Illarionov, former advisor of President Putin on economic affairs, Russia had been preparing for a war against Georgia since 2004, after Saakashvili aligned himself with the West.
and had returned Ajaria under his rule (Le Monde, 25 October 2008; Ekho Moskvy, 19 August 2008).


14. ‘Russia to downsize Armed Forces to 1 mln by 2012’, RIA Novosti, 14 October 2008; ‘Russia’s radical military reform in progress’;


• The original version of this article appeared in Carré in January 2009 (pp. 46-49)

Not the happiest looking soldiers. According to Colonel De Haas’ “information, one reason why Russian soldiers rode on their vehicles rather than in them, was because they believe the armour to be too thin to be useful.”
INTRODUCTION
Located in Central Africa's Great Lakes region are some of the most protracted, intractable and pernicious conflicts in the world. The countries in this region share trans-border insurgencies, economic linkages, ethnic ties and fault lines, historical relations, proximity and porous borders, making conflicts mutually communicable. Nestled between Rwanda and Uganda in the north, Tanzania in the east and south, the vastness of Lake Tanganyika and the Democratic Republic of the Congo (DRC) in the west, is the Republic of Burundi. Most significantly characterised by a crisis of governance and a precarious economic base, Burundi is a weak state. Since independence from Belgium in 1962, intermittent conflict has engulfed this tiny state in the heart of Africa.

This conflict has proved not only cyclical and protracted, but also genocidal. Peace efforts have struggled to bring the conflict to its logical conclusion, not the least, in reflection of the particularly intractable nature of this conflict and the issues involved. An International Political Economy (IPE) perspective is appropriate regarding these issues. By IPE, this study refers to the notion, and the analytical approach, that holds that political forces (states, institutions, individual actors, etc.) shape economic conditions, activities and outcomes, and in turn, economic conditions and activities have effects on these political forces and on political outcomes. Thus, this study focuses on the interplay between politics and economics in the conflict, and in the peace process in Burundi.

THE DYNAMICS OF CONFLICT IN BURUNDI
There are two misleading tendencies in the literature on...
the analysis of the conflict in Burundi. The first is to analyse only the current (since 1993) bout of conflict, and to ignore or downplay the various incidences of conflict since 1962. The second is to view the conflict as involving only Hutus and Tutsis. These tendencies generate serious omissions and distortions and may account for the wrong conclusions regarding the conflict in Burundi. The contention brought forward by this study is that exclusion would appear to be the strongest theoretical approach to understand and describe the conflict in Burundi. In this regard, one particular contentious issue has remained constant throughout all the incidences of conflict involving different groups. This central issue has been about the political economy of Burundi that has systematically denied political participation, economic opportunity and livelihood sources for the ‘other’. The Burundian state is a repository of political and socio-economic security where the ‘other’, defined in ethnic, regional, intra-ethnic, clanic, and elitist terms, is excluded and subordinated. Exclusion, and the consequent inequalities and injustices, are a source of acute grievance and motivation for collective violence. The resultant conflict has manifested in a struggle for the control of the state.

There have been revolts, riots, political assassinations, and various forms of violence in Burundi. This study will not chronicle all these events. The focus, rather, is on large-scale conflict involving (more or less) organised groups. Thus the focus is on armed political parties and movements, the government and the army (as actors in the conflict), and large-scale communal violence. The focus is also on the four major incidences of violence in 1965, 1972, 1988, and 1993-to-date. However, to avoid omissions and distortions, the other incidences of conflict and repression, will also be narrated. From incipient conflict, Burundi experienced a transformation to violent conflict after independence in 1962. This violent conflict can be summarised as follows:

As it can be discerned from the above, between independence and 1966, the monarchy faced challenges from both Hutus and Tutsis. Lemarchand (1970:437; 1996:60, 74-75) concludes that the tug-of-war between monarchical and government institutions stands out as the dominant feature of Burundi politics until the proclamation of the republic in 1966. In this regard, it was generally agreed after independence that Burundi would have a constitutional monarchy, however both Mwambutsa and Ntare became involved in government matters, and both Hutu and Tutsi leaders, in turn, accused them of ethnic favouritism. Given the above, however, what

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<td>1965</td>
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<td>Attempted coup &amp; communal violence</td>
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<td>Tutsi army officers under Micombero</td>
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<tr>
<td>1969</td>
<td>Hutu army officers &amp; politicians</td>
<td>Tutsi dominated military government</td>
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<td>1972</td>
<td>Hutu politicians, army officers &amp; armed groups</td>
<td>Tutsi dominated military government &amp; communities</td>
<td>Attempted coup, insurgency &amp; communal violence</td>
<td>Hutu genocide, Tutsi-dominated government maintained</td>
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<td>1976</td>
<td>Hutu army officers under Bagaza</td>
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<td>Hutu dominated military government under Bagaza</td>
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<td>1987</td>
<td>Hutu army officers under Buyoya</td>
<td>Tutsi dominated military government</td>
<td>Coup &amp; communal violence</td>
<td>Hutu dominated military government under Buyoya</td>
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<tr>
<td>1988</td>
<td>Hutu armed groups &amp; communities</td>
<td>Tutsi communities</td>
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<td>Repression, Tutsi-dominated government maintained</td>
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<td>1989</td>
<td>Hutu army officers &amp; politicians under Bagaza</td>
<td>Tutsi dominated military government</td>
<td>Attempted coup</td>
<td>Repression, Tutsi-dominated government maintained</td>
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<td>1991</td>
<td>Hutu armed groups</td>
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<td>1993</td>
<td>Hutu army officers</td>
<td>Hutu-led power-sharing government under Ndadaye, Kinigi, Ntaryamira &amp; Nibantunganya</td>
<td>Attempted coups &amp; communal violence</td>
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<td>1996</td>
<td>Hutu armed movements</td>
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<td>TGoB under Buyoya &amp; Ndayizeye, Hutu-led power-sharing government under Nkurunziza</td>
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are the issues involved since 1966? On the surface, it would appear as if the conflict in Burundi is between Hutus and Tutsis. However, a close examination reveals a much more complex reality.

Ethnic Exclusion

Ethnicity does play a considerable role in the conflict. As Herisse (2002:3) holds, the demographics in Burundi are Hutu 85%, Tutsi 14% and Twa 1%. However, ethnic differentiation in Burundi is not primordial, it is constructed and instrumentalist. As Chazan et al (1999:107) point out, the assertion of identity is largely in the context of unequal access to political and economic resources, patronage, persecution, and repression of different groups in society. Ethnicity is also used as an instrument for political and economic mobilisation. Thus, ethnic difference is not the cause of the conflict. Ethnicity merely reflected the identity of opposed forces, a character of the conflict.

In Burundi, ethnic differentiation was constructed in the context of an exclusive political economy. The general correlation between ethnic origin and socio-economic status, and the exclusion of Hutus from virtually all of Burundi’s key political and socio-economic institutions, has made ethnicity the most salient fault line in Burundi. As Ndikumana (2004:5) relates, in post 1966 Burundi “(e)thnic identity became a crucial determinant of one’s social mobility and ethnic exclusion became the foundation of the political system, which generated political instability and eventually led to conflict”. The manifestation of this conflict is clearly visible in the case of the four major incidences of conflict in 1965, 1972, 1988, and 1993, as well as in 1969, 1991, and 1996.

Regional Exclusion

The conflict in Burundi mainly stems from regional exclusion. As the International Crisis Group (1999:4-6) and Nkurunziza and Ngaruko (2005:24-25) point out, Michel Micombero, who ousted the monarchy in 1966, initiated the rule of an ethnic and regional oligarchy from Bururi province. This oligarchy remained over-represented and continued to occupy key posts in the economy, especially the coffee industry. Bururi has also accounted for the largest number of Tutsi leaders, in and outside of government, since 1966. In this regard, Nyang’oro (2001:3) and the International Crisis Group (2003:6) point out that the military dictators of Burundi: Michel Micombero (1966-1976), Jean-Baptiste Bagaza, (1976-1987) and Pierre Buyoya (1987-1993 and 1996-2001), are all Tutsi-Hima from Bururi province.

Ndikumana (2004:13) and International Alert (1996:1) hold that the education system and military service are two of the main dimensions that formed the foundations of the politics of exclusion, and served as tools of maintaining this Tutsi dominance. A UNDP report (cited in Jackson, 2000:3) concludes: “...the non-access to education and training constitutes a factor of exclusion from information, and may be the principal source of other forms of exclusion”. Nkurunziza and Ngaruko (2005:25, 27-28) submit that in the 1980’s Bururi alone received about 60% of donor aid for education, and that in 2001 all the 37 highest command posts in the army were held by Tutsis, 73% of them from Bururi province. The governments of this Bururi oligarchy (1966-1993, and 1996-2001) were challenged not only by Hutus, but also by other Tutsis. Thus, all the incidences of conflict in Burundi have originated from, and reflected, the dominance of Tutsis in general, and Tutsis from Bururi province in particular.

Intra-Ethnic Exclusion

Another pattern of exclusion has pitted Tutsis from Bururi province and other Tutsis. The International Crisis Group (2000:24) and Ndikumana (2004:12) relate that there have been incidences of power struggles between Bururi Tutsis and Tutsis from other regions in Burundi, especially Muramvya province. Bentley and Southall (2005:43, 47) point out that Tutsis are divided between Tutsi-Hima and Tutsi-Banyaruguru. Lemarchand (1970:24; 1996:82) explains that in pre-colonial times and in the time of the monarchy, Banyaruguru enjoyed a higher social status vis-à-vis Hima. From the period of the First Republic, Banyaruguru were no longer the privileged recipients of wealth, status and power. This dichotomous relationship between Banyaruguru and Hima was to play itself out in the period after 1966. In 1971, Tutsi-Banyaruguru orchestrated a failed coup in an attempt to usurp power from Tutsi-Hima hegemony. On July 1971, charges of conspiracy were laid against Tutsi-Banyaruguru leaders from Muramvya (including Ganza members). On 14 January 1972, a military tribunal issued nine death sentences (four officers and five civilians) and seven life sentences for these leaders. On 04 February 1972, buckling under international and national pressure, the government commuted the death sentences to life sentences, and released five of the seven defendants (Lemarchand, 1970:24; 1996:82). Thus, again, this demonstrates that the conflict is not ‘ethnic’, but revolves around exclusion as the
basis of the political economy in Burundi, and exclusion as a motivation for collective violence.

Clan-Based Exclusion
The conflict in Burundi also stems from clan-based exclusion. The 1989 Bayanzi abortive coup provides an example. As Lemarchand (1996:134, 139-140) explains, Bayanzi and Bashingo are Tutsi-Hima clans. Jean-Baptiste Bagaza is from the Bayanzi clan, whilst Pierre Buyoya and Michel Micombero are from the Bashingo clan. Thus the Bayanzi’s attempted coup in 1989, during the Third Republic under Buyoya, was seen as an attempt to restore Bayanzi hegemony initiated under Bagaza. In the Second Republic under Bagaza, Bayanzi became the privileged recipients of wealth and power, in and outside of government. On 10 and 15 March 1989, 19 conspirators of the attempted coup were arrested. All 19 (five civilians and 14 army officers) were from the Bayanzi clan, including Isidore Nyabyo, Minister of Public Works under Bagaza’s government. They were never brought to trial and were released in August 1990. Subsequently, all Bayanzi were purged from positions of authority: in the army, public administration and the private sector. Yet again indicating that the conflict emanates from exclusion as the basis of the political economy in Burundi.

Elitism and Personalised Rule
Elitism and personalised rule is another fault line in Burundi. In this regard, Reyntjens (2000:6) states that the vast majority of Burundian Hutu, Tutsi and Twa, share poverty and lack access to health services and education (i.e. social services). Nyang’oro (2001:4) has gone so far as to assert that a small and largely self-appointed and self-serving elite have perpetrated the cyclical violence in Burundi, supposedly acting in the name of the two main ethnic groups. Nkurunziza and Ngaruko (2005:1-2) relate that the ruling elite, through their hold on political power, have ensured control of the economy and its rents by appropriating part of foreign aid and international borrowing, and have allocated public employment and public investment for the benefit of their group. In addition, the taxation of the domestic economy and the organisation of markets have also been shaped to generate rents for those in power.

Elitism and personalised rule has been a hallmark of the Burundian state. In this regard, Jean-François Bayart’s Politics of the Belly, describing the political economy of the privatised post-colonial African state, provides a glimpse of the Burundian reality. Like many African states, the conquest and exercise of government power in Burundi has been with the express aspiration to accumulate wealth for a select minority and to exclude the vast majority. According to Bayart (1993:xvii), this phenomenon is embodied in the Cameroonian expression: ‘the goat eats where it is tethered’. As Bayart points out, those in power intend to ‘eat’. Regrettably, the elite have been ‘eating’ at the cost of the vast majority of Burundians.

A popular peasant revolt has not occurred (yet) in response to elitism and personalised rule in Burundi. However in view of the foregoing, and given the political economy of the state of Burundi (see the next section), the objective material conditions in Burundi make a popular uprising against the elite, not unlikely. This likelihood is, of course, dependent upon the absence of intervention, and also, dependent upon the development of a subjective ‘blame system’ mobilised around common issues. This is an area of concern for the future of Burundi.

The State as Context
In Burundi the state is the context in which the conflict is played out. A study of the political economy of Burundi exposes a state with a crisis of governance and a weak economy. The nature of the state is instructive in explaining how the conflict has manifested in the struggle for the control of the state, as opposed to a struggle for the transformation of the state. As Reyntjens’ (2000:5) asserts, in a country like Burundi, controlling the state is of major essence as it is the main avenue for the accumulation and reproduction of a dominant class. Van Eck (1999:6) also holds that "(o)ne of Burundi’s biggest problems has always been the fact that everybody wants and needs a job within the Government and State institutions due to the lack of alternative employment in the small and declining private sector".

The first weakness of the state relates to the exclusive governance system and issues surrounding legitimacy, i.e. a crisis of governance. The state has failed as an agent of distributive justice: failing to distribute, fairly and equitably, public goods, resources and benefits. Instead, the state has become a predatory state (Ndikumana, 2004:7). The state has historically become an adjunct of Tutsi political and socio-economic domination, to the exclusion of the majority. As Obioha (1999:7) correctly points out, the state is itself a focal point for competition and an actor in the conflict. Given the nature of the state in Burundi, Lemarchand (1996:77)
also argues that when the state is an instrument of group domination, access to the state becomes a source of potential rewards for some groups and of deprivation for others.

The crisis of governance is more acute when one considers the second state weakness, the precarious nature of the economy. As Reyntjens (2000:5), Bentley and Southall (2005:21) point out, Burundi is a tiny landlocked country of a mere 27,834 sq km. Given the land area and population growth, Nkurunziza (2002:2) points out that Burundi is the second highest populated country in Africa (on the mainland, after Rwanda), with a population density of 236 per sq km. Clover (2003:1) holds that if arable land alone (accounting for only 43% of total land) is taken into consideration, this figure jumps to 766 people per sq km. Oketch and Polzer (2002:106) and Lemarchand (1996:152; 2000a:6) relate that peasant communities constitute over 90% of Burundi’s population, and given that agricultural land is the principal economic resource for these communities, inequitable access to land as a livelihood source, has consigned the majority on the fringes of society. Access to land has also intensified the conflict in Burundi. From independence to date, poor economic performance has been characteristic of the state in Burundi. In this regard, Nkurunziza and Ngaruko (2005:7-8) divide Burundi's political economy into three periods: 1960-1972 being a period of ‘institutional instability and economic decline'; 1972-1988, a period of ‘political repression and expansion of the basis for rents', and 1988-to date, as a period of ‘war and economic decline’. Nkurunziza and Ngaruko (2005:9) point out that throughout the post-independence period, investment was generally allocated based on non-economic objectives such as rent seeking, regionalism, nepotism and patronage. Thus, Nkurunziza and Ngaruko (2005:6) conclude that the defining characteristics of the political economy of the state in Burundi have been predatory politics and short-term economic gain. Burundi is one of the poorest countries in Africa. It not only has a weak economy, but also an acutely low human development. In 2003/2004, Burundi ranked a low 173rd (out of 177) on the Human Development Index (HDI) with a Gross National Income (GNI) per capita of only $100 (US). The average economic growth rate of 4% before 1993 turned negative over the rest of the 1990’s. In 2007-2008, Burundi had a Gross Domestic Product (GDP) of only $0.8 billion (US) with a negative GDP per capita annual growth rate of –2.8%. Burundi also ranks 167th (a slight improvement from 2003/2004, but still low) on the HDI, with life expectancy at 48.5 years. The population living below the income poverty line is 54.6% (less than $1 a day) and 87.6% (less than $2 a day).

The weakness of the economy and the acutely low human development in Burundi mainly emanate from the structure of the economy. As OCHA (2003:3), Oketch and Polzer (2002:86, 103, 105-106) point out, the economy is mainly agricultural with roughly 90% of the population dependent on subsistence agriculture. Burundi’s economy is based on the sale of coffee, tea and cotton, which account for 90% of foreign exchange earnings. Coffee alone accounts for 80%. Oketch and Polzer (2002:88) also submit that the exploitation of the coffee industry has not only accrued rents for leaders in government but has also funded the government’s capacity for escalated violence. Thus, Nnoli (2001:3) concludes that the nature of the state and its extensive intervention in economic and social life makes the state a strategic instrument for power and wealth.

The Great Lakes Region as Context

In addition to the nature of the state, Burundi is also mired in the wider instabilities of the Great Lakes region. At the very least, these conflicts can be construed to have exacerbated, if not triggered, the conflict in Burundi. Inter alia, the presence of both Hutus and Tutsis in all the countries in the Great Lakes region has made conflicts mutually communicable. As Lemarchand (2000b:327) and Griggs (1997:2) point out, colonial boundaries (and later border adjustments and population movements) left a substantial number of Tutsis and Hutus as minorities in southern Uganda, western Tanzania and the eastern DRC.

The effect of the foregoing is that ethnic fault lines and ethnic affinity cut-across physical boundaries. Samuel P. Huntington (in Lemarchand, 1997:5; 2000a:16) refers to this phenomenon as the 'kin-country syndrome’. As Lemarchand (1997:5) explains “…where ethnic fault lines cut across national boundaries, conflict tends to spill-over from one national arena to the next, transforming kin-solidarities into a powerful vector of trans-national violence”. Lemarchand (2000b:330) holds that the kin-country syndrome is the key to understanding the conflict dynamics in the Great Lakes. The presence of both Hutus and Tutsis in the countries in
PROSPECTS FOR PEACE AND SECURITY IN BURUNDI

Despite the many challenges associated with the peace process, Burundi has navigated much of the treacherous waters from the Arusha Agreement, to hold elections, adopt a new constitution and institute a power-sharing government. One of the most thorny issues however has been the continuing conflict between the new power-sharing government under President Jean-Pierre Nkurunziza and Agathon Rwasa’s FNL. However, as the International Crisis Group (2007:1, 4-5; 2008:1) and Boshoff (2008:1) hold, the FNL signed a ceasefire agreement on 7 September 2006. In the middle of 2008, and as of August 2008, the FNL was busy with disarmament. However, the issue of re-integration into state institutions and security forces remained unsettled, and the FNL stood accused of continuing to recruit members into its ranks. The current split within the CNDD-FDD under President Nkurunziza, and the conflict between the Presidency and parliamentary opposition groups, also remain matters of concern. These issues may jeopardise the elections scheduled for 2010. Be that as it may, the work of the Facilitation of the Burundi peace process having come to an end on 31 December 2008, as mandated by the Regional Initiative, it is necessary to re-examine the prospects for peace in Burundi. In this regard, the following has particular relevance:

“It must be made possible for the people of Burundi to materially distinguish between the destructiveness of conflict and the benefits of peace”. - Nelson Mandela

As Sandole (2002:1) holds, peace is more than the absence of war or violent conflict. As the above quotation alludes, peace also includes the adequate attainment of equality and social justice, and the reduction or elimination of the underlying conditions for conflict. As Keen (1998:64-5, 67) points out, the end of Sudan’s first civil war in 1972 did not lead to a more inclusive economic (and political) policy that addressed the problems of the underdeveloped south. Thus, the conditions that caused the war remained intact and eventually led to the next war. Keen thus argues that if reconstruction is aimed merely at recreating the political economy when the conflict began, it is unlikely to remedy the reasons why people took up arms to begin with. Reflective of Keen, Kaufmann (1996:158) argues that post conflict peace building requires ‘strengthening the state apparatus’ so that the state can be able to accommodate varying interests and reduce the sources of conflict.

Will state building allow for a more equitable share of the ‘national cake’, i.e. ensure meaningful political participation and economic opportunity, socially inclusive communities and security for all, factors that sustainable peace is contingent upon? This study proposes the reconstruction of the state (state building) as a necessary precondition for peace. It is concluded that political representation, economic opportunity and social mobility, must transcend social categories in Burundi. Notwithstanding who is in power, Tutsi or Hutu, as long as state institutions are not relevant, responsive and accountable, peace will remain elusive. It is also self-evident that the key to sustainable peace lies with the transformation of the conflict generating conditions in Burundi. In this regard there are specific peace imperatives for Burundi.

The first imperative is the transformation of the political economy of exclusion. It is only through politics of inclusion that provide meaningful political participation for all, and a legitimate and broad-based representative government, which stands for the values and aspirations of the majority, that lasting peace can be ensured. This majority, of course, cannot be solely defined in ethnic terms. This is as yet lacking. Alusala (2005:2) points out that currently none of the political parties in the power-sharing government appear to have moved out of the confines of their ethnic enclaves. By fixing fractionalisation into two or three poles, the power sharing approach in Burundi limits the incentives for political parties to reinvent themselves into inclusive and attractive mass-popular movements. There is no incentive to form political values, norms, and practices that would be equally shared and respected. Clearly, dichotomy cannot be the basis for the political system.

In addition, the economy of Burundi has largely reflected the ‘politics of the belly’ where the aspiration and exercise of government power has been with the express intention to accumulate wealth for a select minority and to exclude the vast majority. Clearly, Burundi, as an economic entity that has failed to provide meaningful economic opportunity for the vast majority, needs to be reconstructed. The persistence of
such failure will detract from any achieved condition of peace. Jooma’s (2005) article, We Can’t Eat the Constitution, speaks squarely on this view. According to Jooma (2005:1), durable peace in Burundi is contingent upon the implementation of Protocol IV of the Arusha Agreement, which deals with reconstruction, economic development, refugees and internally displaced people (IDPs). It is also acknowledged in the Arusha Agreement (2000:143) that “...lasting peace is impossible so long as a definitive solution is not found to the problem of refugees and Sinistrés [i.e. IDPs]. Likewise, peace is impossible so long as the country’s wealth is not shared equitably”.

There are, however, challenges regarding the distribution of the country’s wealth in the context of the current structure of the economy in Burundi. In this regard, the dependency on primary commodities is clearly not sustainable in an economy that depends on coffee, tea and cotton to earn over 90% of its foreign exchange earnings. Clearly, the structure of the economy does not lend itself to the creation of wealth and livelihood sources. As mentioned in the Arusha Agreement (2000:132), the diversification of the economy was one of the objectives of the structural adjustment programme starting in 1986. This objective was never achieved. In addition, given the size and land-locked status of the state, low human development, and lack of natural resources, a regional approach should be followed in development strategies. As Nkurunziza and Ngaruko (2005:18) hold, “...Burundi is one of the smallest economies in Africa. In this light, it is difficult to envisage a development strategy based on the domestic markets”. Kitevu and Lind (2001:4) also point out that, a small market, high transaction costs and lack of sufficient communication links, are some of the factors that limit the increased economic capacity of Burundi. Thus, Kitevu and Lind argue, closer economic ties with the countries in the region, through the East African Community (EAC), would create wealth for Burundi within an expanded Eastern Africa market. Other regional organisations (of which Burundi is a member) are: the Economic Community of Central African States (ECCAS), and the Common Market for Eastern and Southern Africa (COMESA).

The second peace imperative must be the reconstruction of the education system and military service. Without the reconstruction of these two instruments of group dominance, there cannot be lasting peace in Burundi. Regarding the education system, Lemarchand (1996:138) points out that the legacy of decades of discrimination in the education system has produced a social pyramid in which the top positions within and outside the government are largely the monopoly of Tutsi elements. Jackson (2000:3) also points out that, inter alia, the changes in the army and its officer corps and changes in the justice system will ultimately depend on more Hutu being afforded educational opportunities. In conclusion, Jackson (2000:5) warns that “(i)f access to education remains unequal for Hutu, Tutsi and Twa, and if the glaring disparities in education provision between different provinces persist, the exclusion that is at the root of Burundi's conflict will remain and any peace agreement will be short-lived”. Ndikumana (2004:22) also contends that the military should be reformed to reflect not only the ethnic makeup of the country, but also the regional imbalances. The foregoing is provided for in the Burundi peace process. However, what remains is implementation.

The third, and last, peace imperative proposed here pertains to the communicable conflicts in the unstable Great Lakes region. There must be greater efforts to resolve the conflicts in the Great Lakes. A number of analysts have concluded, including Wohgelmuth (2000:4) and Van Eck (1999:4, 2000:2), that none of the conflicts in the region can be resolved without major improvements being made in the rest of the region.

IMPLICATIONS FOR THE SA ARMY

The peace process in Burundi has tested South Africa’s staying power and commitment to its foreign policy objectives. The peace process has also demonstrated that South Africa is emerging as a major actor for peace and development on the continent. In this regard, South Africa has contributed facilitators in the peace process since 1999, from former President Nelson Mandella, former Deputy President Jacob Zuma, and currently the Minister of Defence, Charles Nqakula. Former President Thabo Mbeki has also played a key role as part of the Regional Initiative on Burundi. The SANDF has provided a contingent in the peace process since 2001, as the South African Protection Support Detachment, in the AU mission (AMIB), the UN mission (ONUB), and currently the AU Special Task Force. Thus South Africa, the SANDF in general, and the SA Army in particular, have invested heavily in support of the peace process in Burundi. However, given the dynamics of the conflict and the prospects for peace in Burundi, what are the implications for the SA Army in its
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preparations to continue playing a constructive role in Burundi and the Great Lakes region?

- Reflective of the South African government, the SA Army must have staying power and a high level of commitment. The intractable and protracted nature of the conflicts in the Great Lakes demands such staying power and commitment.
- It is also important to understand the dynamics of the conflict. It cannot be overemphasised that understanding the underlying conditions of a conflict is the first step in the settlement and resolution of the conflict.
- It is also important to understand that the SA Army is deployed in support of a political peace process and that the conflicts in the Great Lakes do not lend themselves to military solutions. It is thus necessary to clearly understand the political objectives and to emphasise healthy civil-military relations. Any deployment by the SA Army must also have clear objectives (in support of the political objectives), and a clear exit strategy. The solution to these conflicts lies outside of the realm of the military; the military can only provide security and stability.
- Training and education relevant to peace missions should also be emphasised. This includes a whole range of issues, including: language training (especially French and Kiswahili), specialised capabilities like engineering, communications, etc, and infantry training.
- Lastly, strategic sea- and airlift capability, including long-range logistic and medial support, is of paramount importance. Given the distances involved, and the general lack of infrastructural development in the Great Lakes, such capabilities are vital.

CONCLUSIONS

Recalling the thesis of this study, it is important to reiterate that there has been one particularly contentious issue that has remained constant throughout all the incidences of conflict involving different groups in Burundi. The central issue has been about the political economy of Burundi that has systematically denied political participation, economic opportunity and livelihood sources for the ‘other’. This exclusive political economy has been dominated by Tutsis in general, and Tutsi-Hima in particular. Exclusion, and the consequent inequalities and injustices, has been a source of acute grievance and motivation for collective violence. The resultant conflict has manifested in a struggle for the control of the state between these lineages often led to conflict. In the period leading to independence in 1962, political parties were formed around, and reflected, this intra-dynastic competition for the control of the state. The end of this dynamic conflict was signalled by the assassination of a Bambutsa prince, Prince Louis Rwagasore (Mwami Mwambutsa’s eldest son), in 1961. In 1966, Michel Micombero’s government abolished the monarchy, finally ending dynastic conflict. See Lemarchand (1970:22-23, 318, 323-324, 328, 335, 341-342, 501; 1996:37, 44).

• See page ii to view the actors in the current conflict.

• There are three approaches in the ‘ethnic’ analysis of conflicts, which hold that ethnicity can be primordialist, constructivist, or instrumentalist. Although it is not the intention of this study to empirically validate or invalidate the three approaches in the case of Burundi, it would appear that a primordial approach would have
limited utility as the history of Burundi reveals no evidence of primordial or atavist conflicts between the ethnic groups.

• From 2001 to 2003, Pierre Buyoya was President in the context of the TGoB in accordance with the Arusha Agreement.

• For the indicators and statistics on Burundi see, for example, the United Nations Development Programme's

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BACKGROUND
Violence against women and children that was once a side effect of war, have become a deliberate strategy in many armed conflicts. Consequently, in 2000 the United Nations in an effort to recognize that war affects men and women in different ways, responded by passing the United Nations Resolution 1325. This Resolution reaffirmed the important role of women in the prevention and resolution of conflicts and in peacekeeping, and called for gender mainstreaming to be incorporated in all multi-national peace operations, as not only something that is beneficial, but essential.

At a regional level, Resolution 1325 led African Heads of States to adopt the Solemn Declaration on Gender Equity in Africa, and collectively pledge their commitment to gender mainstreaming and to the protection of women from violence and discrimination. The New Partnership for Africa’s Development (NEPAD) established a Gender Task Force to give a gender perspective on issues within NEPAD, and the South African Development Community (SADC) agreed to comply with these international declarations. The commitment was made to increase the number of women in decision-making to 30% – the critical mass necessary for women to make a political difference. The same targets were set for the armed forces, where it was agreed that the number of women in uniform in peacekeeping operations was to be increased.

Gender mainstreaming for peace operations: What this means for the SANDF?

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Peace support operations demand more of soldiers than fighting – even kissing babies, something most male soldiers find difficult to do credibly!

Image supplied by: Major Werner Klokow
Armies can never lose sight of the basic fact that female soldiers must be soldiers first and foremost. Only then will they be an asset rather than a burden.

This has given fresh momentum to the inclusion of gender perspectives in international peace and security work. The assumption is that the higher the percentage of women serving in the military and in decision-making roles, the greater their capacity to influence security policy and bring about a more gendered approach to security. The attributes commonly associated with women, namely that they are more compassionate, intuitive, conciliatory and less aggressive, are qualities desired in peacekeepers.

Whether this behaviour is the result of social conditioning or biological determinism, is subject to much dispute. In fact, the essentialist arguments that women are ‘biologically’ more peaceful hold little ground. The capacity for violence is socially determined, and just as it is possible to train men to become more aggressive, so can women; and the converse is also true, that men can be trained to be more compassionate. However, women, given their inherent nurturing roles, are on average less aggressive and prone to violence than men.

Against this brief background, the first part of this paper begins by outlining why gender mainstreaming is beneficial for peacekeeping operations. Thereafter, reference is made to the challenges greater gender integration brings and lastly, what this means for women being deployed on peace missions.

**BENEFITS OF GENDER MAINSTREAMING**

Although there is no proof that women make good peacekeepers, there are indications that the presence of women improves an operation’s chances of success in various ways. A Ministry of Defence study in Britain found that “contrary to the view of traditionalists, the operational performance of groups improves greatly if both sexes are involved”. This is due not only to the fact that men generally do not want to be out-performed by women, but because the women complement the strengths and weaknesses of men.

Women tend to identify more closely with the problems facing the host society, especially within war ravaged societies where women have been adversely affected by the conflict. Interviews with women who have served in the Democratic Republic of Congo confirm these sentiments, stating that it is far easier for them to reach out to distressed women and to get involved in community projects. It is also assumed that including a greater number of women in peacekeeping operations, will empower and facilitate the involvement of
local women in peacekeeping, reconciliation and rebuilding structures. Whether they indeed empower women in the host community, is an area where more field research and statistical data is needed.

Clearly where the local population is hostile to women in uniform, their effectiveness will be limited. However, where they are welcomed and able to interact with local women, they can not only contribute to the mission environment, but increase the access to valuable local information. They are also crucial to security where women have to be searched at checkpoints. In Somalia, for example male soldiers had to frisk local women for weapons. While these searches were necessary, they violated social conventions about men touching women. Women peacekeepers can conduct such searches without disrespect to either the women or their culture.

Female participation does not have to be large to have a positive effect. Reports indicate that even where women peacekeepers form merely a token representation, they are able to reduce the level of sexual harassment and violence against local women by men – a problem which has been steadily growing throughout the 1990s. The increased number of women serving on these missions has reduced the number of rapes and other forms of abuse of power conducted by male peacekeepers against local women. Hence, female participation is important not only from an ethical point of view, but has a positive effect on mission success.

**GENDER INTEGRATION IN THE SANDF**

The SANDF is committed to these international gender mainstreaming initiatives, although it still has some way to go in putting theory into practice. According to Hicks-Stiehm, to achieve gender balance and mainstreaming, organisations have to proceed through three crucial stages. The first is to overcome the Inertia of institutions to continue as they are; the second is the need to develop and implement policies; and the final stage is Institutionalization – where it becomes accepted practice. Most armed forces, including the SANDF find themselves roughly entering this final phase, where the need exists to move beyond policy to practice.

The first step is to increase the number of women serving in the military, and then to deploy them in greater numbers in peacekeeping operations. As mentioned, for women to have any notable impact on the work environment in a gender positive way, there seems to be a need for about 30% representation. In terms of actual numbers, female representation in the SANDF has increased significantly over the past few years with the emphasis placed on gender equality. To illustrate this, the percentage of women serving in the SANDF increased from an average of 11% in 1994 to 13% in 2000 to 19.5% in October 2007. In addition, women comprised almost 11% of the senior leadership positions rank Brig Gen and above. Here it is of interest to note that while 11% of women served in the senior ranks of Brig General and above, they are well represented in the junior officer ranks of 2nd Lieutenant/Lieutenant (35%) and Captain (36%). Should these women remain in the military, a critical mass of 30% proposed by government may well be achieved within the next decade.

The racial/gender profile of the SANDF has also changed markedly over the past decade. In 1994 white women made up 81% of the female component, today they represent 22% with the majority being African women 65%. While well represented in the lower officer ranks (around 22%), at troop level white women make up less than 3% of privates. This implies that the burden of peacekeeping will fall more heavily on African women, which will pose some challenges for the SANDF in future, especially where these women are single parents, and where they experience cultural subordination from their male colleagues.

As for career options, whereas in the former SADF women served only in supportive roles such as finance, personnel, logistics, intelligence, medical services and welfare, today women in the SANDF have an open career. While many still serve in these supportive roles, by October 2007 an estimated 14% served in the armour corps, 18% in artillery, 8% infantry, 21% combat navy and 6% as aircrew (including pilots). Women receive the same training as men, and there is no gender discrimination except with respect to facilities and certain drill adaptations that are considered fair discrimination based on physiological differences. Overall it appears as if men accept the right of women to serve in these positions.

A recent survey conducted between 1 August 2007 and 29 February 2008 showed that 77% of men and 82% of women agreed that women have the right to serve in any corps in the SANDF, with little difference in attitude by rank, race or division. There was also relative consensus (80% male and 75% female) that the standards should be the same for women when they train/work in the traditionally perceived male environments such as armour and the Special Forces. On whether they experienced some form of discrimination on the grounds of gender (male or female), less than a quarter (22%) of both men and women agreed with this statement. However, reflecting on past trends it appears as if the perception of gender discrimination is on the increase and that this is felt slightly more strongly by men (21%) than women (18%). This may be ascribed to the advancement of women in the SANDF and the resentment among males, who now have to compete with women for posts.

Acceptance of women in the military does not mean that prejudice against them in certain hard-core combat roles does not exist. Men still consider women more suited to support positions because they are physically weaker. Although the “traditional arguments of women’s physical and mental suitability for warfare appear to have been effectively countered by growing evidence that women are able to

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participate at a level comparable to men if given the proper training, orientation and leadership", in reality few serve or desire to serve in combat roles. As DeGroot18 states “few actually want to drive a tank ... they are attracted because they want to serve their country or because they are attracted to the thrill of landing a fighter aircraft carrier in choppy seas... the women who aspires to a military career often wants only to change a few rules regarding where and in what capacity she herself might serve”.

Most women prefer to serve in areas where they feel they can perform well and oppose being forced into combat branches. However, those who make it in the combat branches19 often feel inferior and experience the pressure to adopt masculine attributes to be recognised as true soldiers19. As these women are often held up as ‘icons’ by the military, it in effect socialises women to become more masculine, as this defines their soldierly identity and status. This identity is manipulated or recreated through training, and just as men are “trained to become masculine soldiers”, so are women who are subject to the same training regimes.

So, do women ‘really’ benefit an operation other than by just increasing gender equality?20

If women are being recruited into the military based on the special qualities argument, this is an important question. Are we forcing women to become ‘manly soldiers’? Is there a point at which women form a sufficient critical mass to transform the military according to feminine interests, and will this contribute towards altering the nature of defence forces and war?21 In all my conversations with military women, they confirm that they are judged differently, have to prove themselves before they are accepted by male colleagues, need to be more assertive and less compassionate to fit into the masculine culture of the military.

One should also not lose sight of the fact that women are not a homogenous group, and that issues of masculinity and femininity differ greatly between cultures. Menon and Kotze22 found that in the SANDF, white women feel less empowered and integrated because they are not regarded as professional ‘career’ soldiers, given that they serve mainly in support roles, and face role ambiguity in terms of home-maker versus career. Black women in turn experience their disempowered mainly due to cultural impediments, sexual harassment and family stress23. This shows that there is a cultural gender divide, where white women feel disempowered due to institutional constraints and traditions, while black women experience subordination more in terms of traditional African culture, claiming that “men find it difficult to take orders from women” and appear to carry a heavier burden in terms child-care responsibility and their experience of sexual harassment24.

Clearly these gender stereotypes affect women’s power and influence in decision-making and leadership positions. An aspect often ignored, but central to the discrimination women experience in the military, is the double standard of sexual morality that both reflects and reinforces gender inequality. Within the military women are judged by their sexuality in a variety of ways. Unlike men, whose sexual prowess is admired by peers, for women this is seen to subvert military discipline and authority. For a woman to be a respected soldier she needs to be an honorable woman or face being assigned derogatory labels such as ‘state mattress’, ‘whore’ or ‘slut’, or otherwise ‘lesbians’.

Once a woman is seen to have loose morals, it affects her status and the respect assigned to her, with debilitating consequences for leadership. According to research by Mankayi25 women are often accused of using their sexuality to “achieve success in the system”, in other words to get promotion or preferential treatment. From whatever angle, it is clear that sexuality has a marked influence on issues of leadership and authority. As the number of women in the military increase, matters of sexuality and sexual harassment will invariably become more prominent.

Where women are not respected in society, this will be reflected in authority and sexual relations within the military. In South Africa women, particularly African women, have been the disproportionate victims of domestic violence, rape and abuse. In a survey conducted among SANDF personnel in 2000 for example, 37% percent of female employees and 30% of military wives reported having been subject to abuse or a violent relationship. Almost half (47%) of the men responded that it is natural for men to have control over others, that wives should do what their husbands tell them (41%), and that a man must do whatever he needs to do (including using violence) to ensure that his wife behaves properly26. Many instances of domestic violence and sexual abuse go unreported or are reported but not processed through the legal channels.

This may explain why in the DOD’s own Official Report for 2005-6, only one case of sexual harassment was listed. The impact of sexual harassment, abuse, violence and rape has serious implications for military discipline, authority relations and operational effectiveness. Where women lack the freedom to report these offences and feel physically threatened, they cannot reach their full potential. As men are the main perpetrators of these offences, there needs to be a commitment to report and eradicate soldiers who are guilty of such conduct.

CHALLENGES OF DEPLOYING WOMEN ON PEACEKEEPING MISSIONS

Although we are slowly seeing a military culture evolving that is more androgynous and receptive to the unique contribution women can make, this does not negate the fact that women face greater challenges than men during deployment. In general, women find the harsh physical environment of deployment more taxing than men, especially in terms of climatic adaptation and their own personal hygiene. The lack
of ablution facilities, privacy and social isolation, especially where they are in the minority, place a greater emotional strain on women than men. There are few senior women role models in operational areas to provide the support for females, and this adds to their feeling of isolation.

Besides the normal stress of coping within a hostile environment, SANDF women report higher levels of family related stress. Particularly where they lack the support structures or are single mothers, their natural maternal instincts often cause them to be preoccupied with whether their families are coping both financially and emotionally in their absence. Upon their return, many experience post-deployment stress. Although not unique to women, upon returning they find that their families have learned to function without them and they often have trouble re-integrating themselves. As previously indicated, issues of trust often arise between partners after the long separations, and all of these factors tend to affect their willingness to redeploy, or remain in the military.

A host of factors aside from family responsibilities influence why women may or may not be willing to serve in peacekeeping operations, and these differ by race. It seems that the opportunity to gain operational experience and the allowances currently being paid to SANDF peacekeepers are a major driver in the decision to volunteer. However, this may not be a sufficient incentive to re-deploy. Within the SANDF many women still experience dissonance regarding their positions and role in the organisation. Women report lower levels of job involvement and organisational commitment than their male counterparts. Often this is due to the role ambiguity women face between being a professional military woman, a primary caregiver, homemaker or mother. Significant practical issues such as the effect of pregnancy and maternity leave on careers, all affect women’s commitment to military service. Often they are faced with the choice of pursuing a military career at the risk of losing their family.

The additional concern, not adequately addressed, is the fear of placing women in danger where they can be subject to physical abuse or rape if captured by opposing forces, and how this influences commanders’ decisions to deploy or withdraw force contingents that include large numbers of women. These are serious concerns and need to be assessed realistically for the safety and benefit of both men and women peacekeepers. Clearly there are certain roles in peacekeeping operations to which women are more suited, and others where it makes sense to use more men. The issue with gender mainstreaming is not to treat women as equal to men, but to respect women equally for the unique contributions they can make to mission success. Not enough attention and recognition is given to the strengths of women, nor to the unique challenges they face as women.

Women are good at empathizing with people as this member of the SAPS is clearly demonstrating in Darfur.
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CONCLUSION

To date, women’s involvement in military peacekeeping remains limited. Not only are they underrepresented in terms of numbers, but at both decision-making and institutional level their unique contribution remains constrained by the overriding patriarchal masculine culture of the military. Of late, increasing pressure on nations for greater gender equality appears to be changing these gender dynamics, but at the same time are bringing to the fore other gender concerns, hitherto not fully understood by the military and often absent in debates on gender mainstreaming.

Although policies and practices aimed at gender equality in the DOD are in place, this cannot occur where men do not respect and recognize the contribution women can make. One cannot talk of gender mainstreaming where the promotion and empowerment of women, which is necessary to maximize the human potential of the armed forces, is not fully understood. For women serving in the SANDF, the issue is no longer whether they may serve in combat, or in peace operations, but whether they can do so in a gender friendly environment. Legally and politically the mechanisms are in place to ensure that policies are implemented, but true equality cannot be achieved where the support structures are absent and attitudes that render women inferior and subordinate remain unchanged.

In terms of representation, the number of women in leadership and decision-making structures is still not sufficient to bring about a substantial shift in the patriarchal structure and culture of the military. However, their growing presence is serving as a powerful tool to challenge societal stereotypes and particularly within the peacekeeping environment their unique contribution is increasingly acknowledged – but still not respected. Little time and effort has been devoted to discussions of when a job is most appropriate for men given their strengths, or for women given theirs. Unless there are debates around these issues, based on empirical evidence of where women have led to the success or failure of missions, gender equality is doomed to fail and can only exacerbate existing tensions and resentment.

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1 Acknowledgement is hereby given to Ms Noelle van der Waag who contributed to this research in an earlier version of this paper titled ‘Gender integration in Peace Support Operations: Old and New Challenges facing the South African Armed Forces, presented at the SA Sociological Association Congress, 7-10 July 2008, Stellenbosch University.


3 For example, Rights of Women in Africa – Protocol to the African Charter on Human Rights in Africa; the Namibian Plan of Action on Mainstreaming a Gender Perspective in Multidimensional Peace Support Operations; the AU Solemn Declaration on Gender Equality in Africa; and the SADC Declaration on Gender and Development.

4 E. Schroeder, ‘A Window of Opportunity in the Democratic Republic of the Congo: Incorporating a Gender Perspective in the


9 Davis and Mckee, ‘Women in the Military’, p. 70.


11 L. Olsson, ‘Mainstreaming Gender …’, p. 2.

12 G. De Groot ‘A few Good Women’, p. 36.

13 Ibid


18 At the recent Gender Conference on Soliciting Male Support for Gender Equality in August 2008, women reacted with applause when I mentioned this, indicating that most women do not want to be forced in combat mustering.


20 L. Olsson, ‘Mainstreaming Gender’, p. 11.


29 Ganyane, ‘Gender Differences …’, pp. 35-37.
Assessing conflict trends in Africa

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AK-47s and other light weapons are readily available throughout Africa, allowing any group with a grudge to take up arms. That can make for complex conflict mixes.

INTRODUCTION

Africa’s conflict trends and their impact, set against an international community that is increasingly not prepared to respond, demand that South Africa as a country prepares its forces not only to address national territorial concerns, but to also have the capacity to operate beyond its borders, throughout the continent.

However, before examining the perceived roles and functions of the SANDF up to the year 2020, there are several significant caveats that we first need to understand. These caveats play an important role in shaping our understanding of the nature of the conflict trends now and in the future, as well as act as a necessary guide for the SANDF when ultimately called upon to fashion appropriate intervention mechanisms.

These dimensions are discussed in a hierarchical cascading manner from the African Union’s Regional Economic and Security Communities (RECs); the nature of the African state; the nature of the African military; and finally, the nature or typology of African conflicts and their combined impact. Understanding these four aspects is important as, to be able to operate in Africa, any state organs need the continental legitimacy that comes from working with and within existing structures and with/through states in the conflict zone.

The first dimension to consider is the capacity or lack of the ‘legitimate’ five pillars responsible for the continent’s peace, economic development agenda and security. These are the RECs in North, West, Central, Eastern and Southern Africa, designated for this role in a resolution by the Organisation of African Unity (OAU) in 1976. This position was later reiterated through the Lagos Plan of Action in 1980 and the subsequent Abuja Treaty of 1999, as well as the 1987 Summit of the Heads of Government. More recently, both the African Union (AU) and the Pan African Parliament (PAP) have also called for increased regional economic and security integration. Most RECs emerged initially as economic development
vehicles. Generally after a decade, the same received an added responsibility of serving as a security mechanism. In the latter role RECs are expected to address the external security concerns of the ‘security community’ while also ready to intervene in conflicts between its members.

Without digressing too far from our main discussion, the current security assessment of RECs reveals that only two, the Economic Community of West African States’ (ECOWAS) Military Monitoring Group (ECOMOG) and the Southern African Development Community (SADC), have demonstrated a capacity to deploy and sustain in the field an integrated regional force. Since the late 1980s ECOMOG has deployed in Liberia, Sierra Leone, Guinea Bissau and more recently in Côte d’Ivoire, while the SADC has participated in operations in Mozambique, Democratic Republic of Congo and Lesotho. However, in all cases, both RECs have revealed shortcomings and an inadequate capacity as well as lack of resources to carry the burden without international support. In practice there are no structures in place in the Northern and Central regions while the 11 states in the Horn, the Eastern Region, have some of its members taking up arms against each other. Ethiopia and Eritrea fought a bitter war from 2000 until ceasefire under the United Nations; Somalia is wrecked by competing warlords with a shaky transitional government inserted into the capital Mogadishu; the conflict in Northern Uganda has rendered that region ungovernable, while more recently Ethiopian troops were repulsed by Kenyan forces along their common border. Against this background drought, famine, increased desertification, floods, locusts and a new feature, pirates off the Somali coast, have confirmed the lack of capacity to provide community security through the regional REC.

The second consideration is the ‘nature of the African state’, representing the basic organisation of entities making up the AU. Again briefly, after colonialism, decolonisation, military dictatorships and the Cold War, Africa is replete with collapsed states, weak states, transitional governments or treaty states and generally emerging states that are most experiencing constitutional crises. State capacity does not go far beyond enjoying sovereignty and hoisting the flag. At the moment, a number of large and significant African states are being governed by transitional arrangement under “peace or ceasefire pacts.”

The third element to be examined is the nature and state of the African military, an institution that differs from state to state and whose capacity has been influenced by colonialism, ethnicity, historical political events, transitional and treaty arrangements of power sharing and even regional conflict dynamics. What is in place in some of the countries are factions that are still to be integrated nationally and constitute an organisation which the incoming forces could work with. Examples abound, such as represented by the peaceful processes in Angola, Sierra Leone, Liberia, DR Congo, Sudan and Burundi. On the other hand, events in Côte d’Ivoire represent a national force that has split into two, based on ethnicity and regionalism as well as political competition.

In any intervention towards assisting the conflict situation on the continent or working towards a ‘forward defence strategy’ in containing the spill-over effects of the instability and violence, the SANDF has to factor in how they should integrate their external commitments with RECs, national governments and local militaries. It is also true that the structure and composition of the SANDF at home is also an important dimension that the rest of Africa also takes into account in forging close working relationships.

The fourth and final dimension of the caveats is interrogating the nature of war and conflict in Africa. A recent survey of wars and conflict in Africa over the last decade reveals the following:

- Any intense war fighting is limited to an average of 3 weeks.
- Forces engaged in such intense fighting number only a few thousands, are secretive, highly mobile and assisted by limited air power, especially transport. Contingents engaged in the fighting also sometimes enjoy the support of governments/states and have integrated elements of conventional and militia units. Their purpose is to create dominant conditions for a more long-term rebel force.
THE COMBINED IMPACT OF WARS AND CONFLICT IN AFRICA

The impact of wars and conflict is diverse and debilitating, creating demands not only for a capacity to stop violence, but also for major interventions towards responding to humanitarian needs. A summary of some of the areas include:

• Wilful destruction of infrastructure and in some cases leaving behind landmines that will for years deny large tracts of land to be used productively unless rehabilitated.

• Conflicts within states, still largely based on ethnic and regional differences, tend to flow beyond the borders and exacerbate ethnic cleavages that ultimately undermine state formation and regional security.

• Many countries are still in that twilight zone of ‘no-war-no-peace’ represented most graphically by Northern Uganda, a region that has not known peace since 1986 and is now host to over 1.2 million refugees/IDPs. The majority of countries in this category can be described as highly vulnerable states.

• The forced and rapid dispersion of population groups into categories of the intelligentsia and professional classes fleeing into exile/diaspora, others into refugee camps and the rest reduced to internally displaced peoples (IDPs). Of those remaining behind, Africa has experienced at least three genocides in the last ten years: Rwanda, DRC and in Darfur. This is the worst form of human rights violation known to man and is a phenomenon that has almost disappeared in major parts of the world. In statistical terms, there are over 9 million registered refugees throughout the world, the majority of which are in Africa, while the continent is also host to a conservatively estimated 15 to 17 million IDPs.

• Major flight of capital and direct foreign investment.

• Regions of the continent characterised by lack of security.

NEW THREATS? (Old wine in new bottles). A TEMPLATE OF CATALYSTS

In assessing the ‘changed nature of war’ the evidence points to the adage, “the more things change, the more they remain the same.” The nature of war now and until 2020 is likely to be characterised by the existing fundamental old causes while adapting itself to the new environment. This old and new entity will shape and influence the way interventions are undertaken, based on the overarching political authority as well as rules and regulations. The following make up what appears to be major sources of conflict in Africa:

• The environment, related to shortages of water, competition towards accessing natural resources ranging from land, diamonds, forestry and riverine products.

• Border disputes.

• Political and ethnic differences characterised by collapsed and weak states.

• Food security.

• Religious and ethnic clashes.

• International terrorism.

• HIV/AIDS pandemic.

• Natural disasters.

• Insecure borders.

PERCEIVED FUTURE ROLES AND FUNCTIONS OF THE SANDF IN SOUTH AFRICA AND AFRICA

The SANDF is likely to serve in the capacities cited below. The same should also influence the organisational structure:

• Expert Security Policy Advisory arm of government able to develop strategic options related to conflict prevention, diplomacy, conflict management and resolution in support of the civil power.

• Traditional country-based defence and security roles and functions.

• Regional security, including assisting with the capacity building of several African militaries that are still in formation. This will demand a dual approach creating a capacity-element of a contingent to be dispatched to different countries to undertake the sort of role previously undertaken by the British Military Assistance and Training Teams (BMATT), and establishing new posts and opportunities within South African military training academies, including the Navy, Air Force and Intelligence.
Stated differently, the SANDF must prepare itself for engaging in the extensive but fundamental Security Sector Reform initiative required throughout most parts of the African continent over the next decade. Participation will involve understanding Africa’s culture, norms, ethnic divisions, history, language, gender and the current and residual international interests while retaining the clarity of the African Union security agenda.

- Natural and man-made disaster response and relief.
- International terrorism initiative and peacekeeping

DESIGNING A ‘NEW FORCE’: THE SANDF UNTIL 2020

A future force for South Africa must be made up of a careful mix of the core force and dedicated ‘mobile elements of train-the-trainer’, whose links with Foreign Affairs are much more integrated than at present. This suggestion is an important one, and is new to the SANDF as currently structured. The second new innovation before we examine contingent parts of the suggested new structure has to do with conduct. The new SANDF must continue to interact with civil society ‘think-tanks’, a feature that is standard in the Developed World but is anathema to most African states. In the majority of states military issues are the monopoly of soldiers and a select band of civilians leaving anyone else interested from the outside considered a spy of foreign governments. As a result of the poisoned atmosphere, the role of the SANDF to break down myths and build confidence and new relationships on the African continent is crucial.

Suggested New Force Structure:

- Intelligence community (integrated: dealing with issues of international relations, regional security, air-sea and land-based information and technology, as well as keeping abreast of civilian-type threats such as bird-flu and SARS) that now has a component to build Africa-wide capacity. The agencies remain fully conversant with debates carried out by policy research think-tanks, universities and other related tertiary institutions.

- Appropriate air power assets, with emphasis on transportation, satellite communications; radar/surveillance and helicopter capacity. All these dimensions must have the dual role of strengthening normal policing, early warning and detection. If this is achieved, it will enhance real-time aspects of conflict prevention and diplomacy allowing the conflicts to remain at the level where normal policing is able to deal with them before they break out into severe crises.

- Combat teams made up of all-arms, at least over two regiments in strength as well as small special weapons and anti-terrorist SWAT units. Whatever is detected by the sophisticated air surveillance assets as described above, there is a need to have a military capacity that can serve as footprint to attack and hold a piece of ground for several weeks in order to allow the wheels of diplomacy and conflict resolution to turn as argued earlier. A preliminary guide would be to have in place a combat team able to be deployed within 72 hours to any part of Africa and maintained for 12 weeks.

- The need to establish a naval capacity for limited off-shore protection of South Africa and Southern Africa against piracy and international fishing and illegal maritime harvesting operators. A new feature of this structure for the SANDF should be an expanded capacity to work in fresh-water zones, taking into account Africa’s Great Lakes and giant river system that has, to date, not been mustered.

- Prepare for supporting large and extended humanitarian relief operations. Although we make this suggestion as a separate and stand-alone notion, integral Army, Air and Naval elements can be allocated this role. The only added burden could be in the expanded roles and further training as humanitarian support units at different times. Given the importance of the function, however, it is significant to keep it separate. Yet another challenge is to begin to train the emerging African militaries towards their responsibilities as conventional forces, the norms and expectations of the international laws of conflict and conduct of forces.

The Rooivalk has the potential to be an extremely valuable force multiplier over the full spectrum of peace support missions, using its mobility, day/night sensors, cannon and rockets to support ground forces or interdict movement by belligerents.

The Badger ICV’s flexibility will suit it well to the more demanding peace support operations: It offers mobility, good day/night observation capability, communications, and fire power, as well as carrying a small rifle section.
The standardisation and harmonisation of concepts is an area that is still largely deficient in most of the still-to-be-integrated African militaries and before 2020 the SANDF could play a role in closing this information and intellectual gap.

- Response to natural and man-made disasters.

CONCLUSION
African conflicts in the next decade are likely to be complex, characterised by population groups going through the phases of state formation, consolidation and post-conflict reconstruction. Approaching the challenge through the strategy of Vision 2020 is useful as it provides an opportunity and platform for consultations and broad-based inputs that should ultimately inform and influence the outcome and organisational form of the SANDF at the earliest possible moment.

REFERENCES AND FOOTNOTES

1 Citing the decision of the 27th Ordinary Session of the Council of Ministers, CM/Resolution 464 stating that, “there shall be FIVE regions of the OAU”; Abuja Treaty 1991, Article 6, 2 (a); CM/Resolution 1043 of the 44th Ordinary Session of 1986 and the 23rd Ordinary Session of African Heads of State & Government, AHGT/Res. 161, 1987 that all called for the regions and the economic groupings such as the Economic Commission for Africa (ECA), the African Development Bank (ADB), authorities of the Economic Community of West African States (ECOWAS), the Preferential Trade Area (PTA), the Southern African Coordination and Development Community (SADCC), as well as the East African Community (ECA) to harmonise and rationalise their activities.

2 For example, Kenya, one of Africa’s oldest states, has been without a nationally-agreed-to constitution since 1964.

3 In order to retain the integrity of the Vision 2020 process, this paper will not cite states that fall into this category for obvious reasons.

4 Take events in the three of Africa’s largest countries, Algeria, Democratic Republic of Congo and Sudan. The army in Algiers is fully deployed against perceived fundamentalists and is still to discard its liberation credential; in Kinshasa, part of the transitional agreement was the integration of the army and as the country moves towards the June 2006 elections, this is still to be achieved; and finally, in Khartoum, following the Comprehensive Peace Agreement (CPA) also known as the Naivasha Agreement, part of the current 6-year transitional process is to create an integrated army, a development that has been largely sidelined with attention focussing on the conflict in Darfur.

5 The Hutu–Tutsi factor in the 1994 genocide in Rwanda, the continuing similar dynamics in the DRC war and the Sudanese religious divide of the Islamic north versus the Christian south represent some of the concrete examples.

6 The lack of security in the Horn and along the Indian coastline has created a haven for pirates forcing the US to deploy its naval, air and military assets in order to reign in the threats to international security.

7 The continent needs serious investment in water catchments and dams in order to move away from surviving on seasonal rain-water according to the map attached.

8 Such as in Western Sahara, Côte d’Ivoire, Eastern DRC, Sudan and more recently between Ethiopia and Eritrea and Ethiopia and Kenya.

9 Liberia, Sierra Leone, Somalia, Côte d’Ivoire, Guinea Bissau and DRC.

10 23 of the 53 African states fall into the category described as “food insecure” by the United Nations World Food Programme (WFP). Since the 1970s, the continent has not been able to feed itself and is the only region in the world that has experienced a “green revolution.” The continent’s population, in its settlement, is split into proportions of 60% residing in the rural areas while 40% is located in the urban areas. Africa’s projected food production over the next ten years will average 1% increase on current levels versus its population increase of about 2.3%.

11 In addressing the SANDF, it is important to observe that South Africa and Southern Africa as a whole comes totally unprepared for the intense religious and ethnic conflicts that occur almost on a regular basis in West, Central, Northern and even the Horn of Africa.

12 As witnessed in Nairobi, Dar es Salaam and Cape Town as well as along the current Somalia-Indian Ocean border.

13 Of the 40 million global HIV/AIDS victims, 77.4% are in Sub-Saharan Africa with Southern African countries averaging national prevalence rates of well over 20%. 13% of global figures, represented by 5.6 million victims, are in South Africa, representing a major challenge. In responding to the pandemic, globally 6 million people are on anti-retrovirals (ARVs). Only 1 million of this figure, however, is from Africa.

14 Areas such as the Indian Ocean coastline, the Niger Delta alongside the Bight of Guinea, Benin, Nigeria, Togo, Ghana and Côte d’Ivoire are havens for pirates with no capacity available to stem this from the mainland.

15 Taking a leaf of the US practices on the Mississippi River could be useful.
The purpose of this paper is to set out and discuss the experimentation journey undertaken by the Singapore Armed Forces (SAF).

Let me begin by quoting the Defence Minister, Mr Teo Chee Hean from a speech that he gave in Parliament sometime in Jun 2004 when he spoke about the SAF undergoing transformation. He said that “MINDEF is moving beyond the steady built up of the SAF as a potent fighting force operating modern, sophisticated and technologically advanced systems to that of a 3rd Generation SAF. He envisaged that the 3G SAF will be a military force that makes greater use of superior technology in areas such as comprehensive surveillance, battlefield awareness, precision strike and network centric warfare”.

Like many established and professional armed forces, the SAF has embarked on a journey of transformation in order to remain a highly effective force whilst staying relevant in changing times. Despite our short history of 42 years, the SAF remains motivated to constantly re-invent itself for the future.

Even though we are now gearing towards a 3rd Generation SAF, we have not forgotten our early formative years of development, particularly during the 1st and 2nd Generation SAF. I will not be going into details on the earlier generations, but essentially the 1st Generation SAF from 1965 to the mid-70s was very much about survival in the midst of domestic instability and regional uncertainty. Our painful separation from Malaysia after a brief merger of two years catapulted Singapore into nationhood. In those foundational years, we learned to recognize that manpower would be the most binding resource constraint on our growth, and sought to address this bottleneck through conscription and talent scouting. The 2nd Generation SAF was able to ride on the back of better economic times, especially in the 80s. We focused on building a credible SAF with steady build-up of its war-machines across the three services. Time and space were given to the respective services to develop their distinctive capabilities and professionalism. For greater cross-Service integration, a Joint Staff was created and subsequently formalized as the Joint Operations and Planning Directorate or JOPD. This Joint Staff performs an efficient integrating function that is critical to MINDEF as an organization. Today, it has expanded to cover intelligence, manpower, training and logistics.

Let me share a little on how we are gearing to shape ourselves into what is now known as the Third Generation SAF (the 3G SAF):

**Changing Strategic Environment** – We are mindfully aware of the world we live in today – a world that is characterized by much uncertainty. Indeed, the SAF is increasingly facing a more complex and dynamic environment that encompasses the challenges of war, terrorism, peacekeeping and even humanitarian crises, as has been seen in the Tsunami disaster hitting the South East Asia region and our involvement at New Orleans. A broad spectrum of capabilities is thus needed for the SAF to respond flexibly and appropriately.

**Not Being Limited By Resources** – Size does matter, and in this respect, Singapore is obviously not endowed with much in terms of resources, the only resource being our human resource. In fact, you will have a hard time trying to find us on the world map. But we have learned not to wallow in our own limitations. Instead, we constantly remind ourselves to stay relevant, and tell our people to invest and be efficient users of the scarce resources we have on this little island. The SAF is no exception. Small as we are, the SAF must be able
to punch above its weight despite its size, whilst constantly searching for new concepts and capabilities that deliver more punch for less.

**Leveraging on Advanced Technology** – Exponential growth in the Information Age has resulted in information technology doubling its power every other year. Emerging technologies such as spectrum of unmanned systems and precision strike have opened up new possibilities for warfighting. The promise of COTS solutions has also become a reality for military computing. Breadth of choice, state of the art technology, lower purchase cost, and lower lifetime cost of ownership, are just a few of the benefits dictating the way militaries are leveraging on COTS. Over the years, the SAF has invested much by building on Singapore’s extensive and flourishing science and technology base for the conduct of advanced research and development. We believe that we can take full advantage of the benefits conferred by new technologies like unmanned systems, precision strike weapons and sophisticated networks. Hence we have invested much in DSTA, DSO and the defence industries that form the important defence technology eco-system within MINDEF.

So how are we defining the 3G SAF?

**Broad Spectrum Capabilities** - We envisage the 3G to be capable of handling a broad spectrum of operations, ranging from peace to troubled peace in dealing with terrorism, peace-keeping, peace-support and humanitarian operations, leading into Military Operations Other Than War, including our ability to flexibly switch the entire SAF war-machine for war-time missions. This capabilities must be matched by the capacity to adapt and respond flexibly and effectively in any given situation and environment.

**Develop Professionally & Fight Integrated** – We believe in the three Services developing their unique professional capabilities within their respective arms. Yet when orchestrated together much like the fist with all the fingers and the palm brought together, the SAF will fight integrated for joint operations against a common front. Our forces are trained with the doctrines and values to operate on land, air and sea, and doing so as a system that is inter-connected and fighting co-operatively.

**People Centric** – People are at the heart of the SAF’s military capability, and people will continue to be the most important element of our success in capitalizing on change. We are emphasizing creating an environment that fosters innovation, alternative views, responsiveness, adaptability and agility. Hence our core values, history, mission and the professionalism with which we are brought together, are what make the SAF the institution that we are today. Quality people define the SAF from the foot soldier to the flight-line, ship’s deck and workstations, as all military operations are essentially a human enterprise – be they National Servicemen or full-time professionals. The 3G SAF will see greater investment into our people such that they will remain forward-thinking and technologically savvy, and able to possess the fighting spirit to overcome challenging situations and prevail over the enemy.

**Top-Down Strategy** – To prepare for transformation, MINDEF established a relatively new outfit called the Future Systems Directorate otherwise known as FSD together with its experimentation arm known as the SAF Centre for Military Experimentation (SCME).

This small outfit was created to lend new perspectives to problems and issues. Not just looking for new problems but sometimes looking at the old problem in a new way.

It was our way of seeking to foster diversity – diversity in terms of views, perspective and even approaches to capabilities development within the SAF.

Led by BG Tan Yih San as the Future Systems Architect, the organisation reports directly both to the Chief of Defence Force and the Permanent Secretary of Defence. It also enjoys direct consultation with the Chief Defence Scientist; Prof Lui Pui Chuen. Together with our partners, we generate ideas and bring together concepts of the future, chart the way forward and advocate the alternatives. Within FSD, we see military experimentation as one of the keys to defence planning strategy. Our aim is to push experimentation with innovative operational concepts that employ emerging military systems and radically new force structures to leapfrog on military capabilities.

We love to see ourselves as being in the business of what we termed as “creationeering.” Developing strong concepts and then designing and creating products to match the development of future warfighting concepts for the SAF.

In terms of budget, we are allocated up to 1% of the defence budget, ie up to $100 million for the conduct of experimentation. This is on top and above of the normal SAF R&D budget, which is about 4% of the total defence budget.

So what are our roles in this transformation process?

There are three main ones namely, Concept Development, Experimentations & Red Teaming.

**Concept Development.**

We are constantly seeking answers on how to transform and to grow exponentially. But we spend much time thinking about the question – the right questions before we begin framing the solutions.

One important aspect of framing the questions is the need for strong operations-technology integration. To come up with strong operational concepts, we need inputs from scientists and engineers to tell us about technology – its maturity,
cost, effects and the implications if we were to introduce it for concept exploration and development. We need to tap into rapidly advancing technologies to develop new military systems that can be applied within the framework of new operational concepts executed by new kinds of military organizations.

Experimentation
These second role of FSD is to drive the experimentation process in the SAF. As you are fully aware, military experimentations in the form of war games, simulations, field demonstrations and especially field exercises, has proven to be a key and essential element of innovation and transformation. Properly undertaken, military experimentations provide a source of great competitive advantage. Experimentation done in its proper context has its benefits. They are:
- Reducing uncertainties.
- Determining the proper mix of emerging and legacy systems.
- Buying options for the future.
- Maintaining balance between innovation and risk.
- Avoiding early buy-in leading to false starts.
- Low-cost alternative & unhinging mindsets.

Here in FSD, we spend much of our time framing issues and problems in context to derive at developing warfighting concepts. We then go through a cycle of discovery of our theory through experimentation to arrive at certain hypothesis. The context is important even as we refine the hypothesis before we are comfortable enough to proceed to the demonstration phase and leading eventually to development of new military capabilities. I must stress that it is not just about introducing technologies, but rather leveraging on them to bring about new concepts in order to create disruptive changes that could give the SAF a competitive advantage.

Two Potential Pitfalls
There are however two potential pitfalls when we experiment with technologies for future warfighting concept.

Firstly we need to be mindful that technologies cannot lose sight of the human dimension even as we focus on building a network-enabled capability within the military organization. They are the agent of change even as we bring new warfighting concepts to the table. If we don’t focus on the human dimension, they will not adapt and will work around new ideas and concepts much to our frustration.

The second potential pitfall is the assumption that with network centricity we are going to get a 100% transparent picture of the battlefield. Is it really possible to have 100% visibility on every person, weapon, terrain feature and environmental factor within every square mile? It is seductive to say yes, but certainly no one can promise an ‘unblinking eye’ across the whole battlespace. Vulnerability of networks is a common concern for all of us. It is therefore more realistic to prepare and educate our commanders to cope with and even thrive in ambiguity.

Let me share with you our experimentation framework that we adopt through our experimentation journey. We are taking a system focus on transformation when we condensed seven high-payoff experimentation thrusts into four key capability areas that straddle an expanding spectrum of operations. These four capability areas are:
- IKC2 (better known as Integrated Knowledge Based C2).
- Precision Strike.
- Unmanned Systems.
- Logistics.

We believe that if we can characterize their role, we can create a decision edge for winning. As such, we are using experimentation to understand their limitations and vulnerabilities, and we are sanguine that we can derive cost-benefit propositions for each of them. This could include trade-off studies and even force-structuring experimentation for determining the shape of the 3G SAF.

So briefly, IKC2 is about leveraging on knowledge as a force multiplier and enabling system-of-systems integration at all three levels of war ie, tactical, operational and campaign levels. Our interest is not restricted to the physical layer, such as sensing and connectivity, but includes the cognitive layer of sense-making for the commander, C2 processes and structure.

Strike as envisaged is about developing conceptual and technical possibilities for realizing the sensor-C2-shooters grid across the air, land & sea domains. In this area, we cannot be tribal in our approach. We will need to look at the force mix, sensor-shooter architecture and C2 processes, and we want to push the envelop to determine what are the cost-benefit propositions that we can bring to the table for exploration.

Unmanned Systems. This is an emerging technology with potential for decreasing costs and increasing performance. They cannot be confined to just being a sensor platform, and we will need to push their suitability for different roles in the air, land and sea environments. If we exploit them, we need to explore employment concepts such as massing them for operations. They can see, swarm and sting like a bunch of killer bees, but can we develop them to have an intelligent self-organising behaviour without intervention?

Finally Logistics. The focus is on how to tailor logistics better to suit the tempo and characteristics of forces, particularly in OOTW missions where we have out-of-theatre forces in real operations. This means re-defining logistics from the
current model of a supporting element with characteristics of agility and responsiveness. We will leverage on information technology to improve command control, which is key to accurate and timely decisions for logistics operations.

These enabling capabilities alone cannot bring about transformational capabilities. They will need to be anchored down on operational contexts based on the expanded spectrum of operations that the SAF is expected to be involved. Four such contexts have been identified:

Firstly, **Precision Strike.** Founded on the principles of precision, persistence and pervasiveness, the capacity to strike need not be the monopoly of a single domain. Using a combination of precision strike capabilities, the objective is to orchestrate strike capability in sustained operations based on demand throughout the campaign.

Secondly, **Manoeuvre.** Moving to win is a vital part of one’s strategy. It gives us option to overcome strategic chokepoints whilst fighting distributed but in non-linear mode with the characteristics of flexibility, mobility and a smaller but lethal footprint. When we manoeuvre with IKC2 and precision strike, we envisage the ability to rapidly concentrate forces and fires to achieve with less force density asymmetrical advantage and effectiveness over the enemy.

**Homeland Defence.** This is a context that has been given sharp focus after 911. We are dealing with low operating signature and, as such, must build in ourselves the capacity to overturn the information disparity between conventional and LIC threats that persist today. Inter-agency tapping of information must be robust so that we can collectively mitigate against attacks.Whilst not precluding possible terrorist acts, we must have consequence management capability such that our robust response will enable us to return to normalcy whilst ensuring sense of resilience. We need, therefore, to experiment on how to overcome asymmetry of information so that we can operate seamlessly with other expert agencies in the area of Homeland Defence.

Last but not least, **OOTW.** We are talking about out-of-theatre operations in the likes of PSO, PKO and humanitarian operations. Given such an expanded spectrum of operations, we will need to experiment with plug-and-operate force concepts for modular capabilities in terms of systems, C2 processes, footprint and force structure.

**3 Examples, 3 Contexts, 3 Challenges -** Our experimentation journey has lent focus in few specific areas for the SAF. Let me share with you three specific contexts that we have done with the Army, Navy and Air Force in solving key challenges and doing it in our context:

First an experimentation with the Army under the concept of “Command Post Anywhere” or CPA. One of the key concerns in army manoeuvre is the issue of survivability of the Command Post during operations. The footprint of a typical Command Post is relatively large, and hence easily detected and be destroyed by the enemy. In the CPA concept, we developed collaboration tools to allow sharing by teams deployed across wide geographical areas. In an exercise in Australia codenamed Ex Wallaby, collaboration tools were deployed at the Brigade Command Post level to determine how distributed teams could survive and function better with improved self synchronization based on the Commander’s intent. Planning tools such as MissionMate, ForceMate and SoldierMate were developed for command posts on the move and on the fly. CPA proved that teams survived better and were able to have improved situational awareness across domains in the airland battle.

Next an experimentation involving the Air Force. Singapore lacks geographical depth, and has to contend with a small geographical area of 40 km by 20 km. During operations, airspace indeed is at a premium, and a scare resource to be competed for by the army, navy and air force users. The proliferation of manned and unmanned aircraft and munitions only worsens the situation during operations. Through the rigor of laboratory exploration, the SAF experimented with the concept of Flexible Use of Limited Airspace (FULA) for collaborative planning and real-time usage of airspace across the three services. We experimented with smart design and application of logic engines as well as creative 3D visualization techniques known as Kinetic Visualization and Aided Focus. Our experimentation has proven that with Augmented Cognition, warfighters are able to break away from the traditional stovepipe methodology of ‘divide-and-operate’ rules to achieve quick and better optimization of airspace, particularly against elusive targets.

Finally, an experiment involving the Navy in Maritime Surveillance Awareness. This was an experimentation which gained wide acceptance at the USJFCOM under the Multi-National Experimentation arrangement. We were able to develop data-analytics tool for trawling voluminous data in order to detect weak signals against asymmetrical threats in the MSA environment. Collaborating with the US, who employed strong visualization tools, we were able to combine our effort in developing comprehensive situational awareness and rapid reaction against sea targets of interest. This system has since been further developed for operation under what is now known as Risk Assessment Horizon Scanning for Singapore.

In conclusion, experimentation allows the SAF to explore future warfighting concepts and doing so with a fine balance between the art and science of war. We are mindful of the need to weave a strong nexus of networking and collaboration with foreign partners such as USJFCOM, Australia DSTO and SwAF from Sweden.
**Introduction:** The Malaysian Army started as an experimental company on 1st March 1933. Twenty-five Malay youth were recruited and trained at Port Dickson by the British. In June 1934, the number was increased to 150, and the following year the experimental company was given the official designation of the Malay Regiment and become a regular force. At the time of independence, 31st August 1957, the Regiment was totally Malayan, bar some seconded British officers. It comprised not only the infantry unit, but also reconnaissance, artillery, signals, engineers, commandos, and various logistic and administrative units.

Today, the Malaysian Army boasts an establishment strength of about 90,000, a large portion of it infantry, reflecting its dominant past role in counter insurgency operations. In the past 30 years the Malaysian Army has taken part in the peacekeeping operations in the Congo, Namibia, Angola, the Western Sahara, Kuwait, Kampuchea, Somalia and the former Yugoslavia. It's has gained world recognition as a formidable and reliable army.

As it has expanded the Army has purchased a lot of sophisticated weapons, equipment and machines to meet its requirements and to enable it to conduct missions within the Malaysian Armed Forces. Since the inception of war, technology changes to weapons systems have been revolutionary, producing profound changes in warfare. Invariably the smart weapon will need smart soldiers. Future military capabilities will be knowledge intensive and require knowledgeable soldiers, and it is time for the Army to embark seriously on becoming a ‘learning organisation’. The organizational development today has gone further, in order to compete with the globalization world. Whether we like it or not, the years ahead will be era of change and competition. The notion of the learning organisation then becomes one of the new buzzwords in the management, psychological and human resource development today.

It seems that is why today organizations are more interested in the concept of the ‘learning organisation’. Before this, they worked seriously on Total Quality Management (TQM) and business process re-engineering. The ideas and concept of ‘learning organisation’s have been well explored by organizations in order to be competitive and stay alive. Burgoyne (1995) argues that such organizations may become vulnerable because they have little spare capacity to come through crises. Therefore the ‘learning organisation’ idea represents a shift to organizational development and growth (Burgoyne, 1995).

The aim of this paper is to illustrate the review of concepts on ‘learning organisation’s’: It covers understanding of ‘learning organisation’s’, the learning process, and the implementation of the concept in the Malaysian Army.

**Understanding the ‘Learning Organisation’**: What is the actual meaning or definition of a ‘learning organisation’? Some writers put emphasis on the learning of all members of the organization (Pedlar et, al., 1991), while others put it on the organization’s competitiveness in all functions (Hayes et, al., 1988, Slater and Never, 1995). There are yet others who put emphasis on the skill and function of the business (Lessen, 1990). Some authors such as Senge (1990) adopt a broader approach, taking all of the other perspectives together. Senge tends to suggest a composite theoretical ideal.

Senge (1990) defines an ‘learning organisation’ as follows: “learning organisation’s are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together”. Senge’s understanding of ‘learning organisations’ has been supported by Pedlar (1991): “The learning company is a vision of what might be possible. It is not brought about simply by training individuals, it can only happen as a result of learning at the whole-organization level. A learning company is an organization that facilitates learning by all its members and continuously transforms it self.”.
‘learning organisation’s are characterized by total employee involvement in a process of collaboratively conducted, collectively accountable change, directed towards a shared vision or principles. (Watkins and Marsick, 1992). Other writers have a simple definition of an ‘learning organisation’, arguing that it means improving and transferring knowledge that improves individual learning (Campbell and Cairns 1994), and Burgoyne 1995 describes it as a culture that shares learning from experience. Whatever the definition is, the important component is the requirement that the organization changes the way work gets done, and has been successful in creating knowledge and transferring it. It is a life-long program of study and practice. It never happens overnight.

The next question is why we need the ‘learning organisation’ in our culture. As Senge (1990) describes it, the reason is as follows: Because we want superior performance; to improve quality; for customers; for competitive advantage; for an energized, committed organization; to manage change; for quality; for customers; for competitive advantage; for an energized, committed organization; to manage change; for the trust it engenders; because the times demand it; because we recognize our independence; and because we want it.

The Learning Process: What does the word ‘learning’ mean? According to Hornsby (2000) the OXFORD Advanced Learner dictionary, the word ‘learning’ is a noun that means knowledge gained by studying or skill gained by studying from experience, from being taught. Stewart (1992) stated that the learning process is natural, continuous, inevitable, and occurs spontaneously within the organism. He implies that learning is discernible at both individual and organizational level, and goes on to the question the exclusivity of Human Resource Development (HRD) and others such as intervention of the learning process. Stewarts’s model of the learning process component is reproduced in Figure 1.

Figure 1: Stewart’s Learning Process Component Model

<table>
<thead>
<tr>
<th>Learning (of individual and organization)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results in</td>
</tr>
<tr>
<td>Knowledge, skill, values and attitude</td>
</tr>
<tr>
<td>Creates the effect of</td>
</tr>
<tr>
<td>Behaviour</td>
</tr>
</tbody>
</table>


This model suggests that learning involves changes in the individual and organization. This characterization of the learning process, expressed in terms of continuous and often unprompted shifts in attitudes, abilities and behaviour, is a useful paradigm to work with - a change in behaviour is a perceived output of the learning process.

Learning is then further divided along low-level learning and high-level learning. Low-level learning refers to the behaviour that may or may not be repetition of past behavior, which is often at the routine level, but where it forms a cognitive association. (Steven et. al. (1997). This is similar to the learning that Argyris and Schon (1978) define as a single-loop learning in which the individual responds to the error by modifying strategies and assumptions within constant organizational norms.

High-level learning refers to the development of complex rules and associations regarding new actions, and an understanding of causality. This kind of learning often affects the entire organization. It is related to Argyris and Schon’s (1978) concepts of double-loop learning, in which the response to a detected error takes the form of a joint inquiry into the organizational norms, in order to make them consistent and effective. High-level learning also refers to the change of mental models and underlying assumptions. Once the learning process occurs, it will be done continuously, which involves the transfer of knowledge as well as gaining the knowledge within individuals, teams, and the organization.

There are few steps in implementing the ‘learning organisation’, however it must be initiated at the highest level of the Army echelon, that is at Army Headquarters. The main questions are how we get started, and what are the strategies that could be followed. Pedler et, al(1991) suggest the following components in order to get the organization to implement a ‘learning organisation’ approach: Work with the board of directors; work from the human resources department outwards; set up a series of task forces; run a consciousness-raising development programme; work with the strategic planning cycle; begin with diagnosis; start with a community conference or ‘teach-in’; start with one department; focus on one of the key dimensions. The favourite tool to measure ‘learning organisations’ is called the “organizational learning mechanism”, which was designed by Armstrong (2003).

Work with the Board of Directors (Chief of Army Board Meeting): The Chief of the Army Board Meeting takes place twice yearly, chaired by the Chief of Army. This meeting sets the direction of the Army for the future. The members of the meeting are all the divisional commanders and the directors of the Army’s components. In some ways this is the obvious place to start. Sooner or later various commanders, at least at the divisional level, will have to support and live out the idea in their actions and attitudes if it is to spread throughout the organization. If these people begin to practice the ideas upon themselves and with those with whom they come into
Work from the Army Human Resources Department outwards: This starting place has the advantage of being where the people management systems are located. The Army Human Resource Department is responsible for human resource planning and the development of the Army’s personnel. For example, if there is a goal setting and performance review process, then the ideas of the ‘learning organisation’ can be linked into this. People in this function may be relatively knowledgeable regarding ideas about learning and development. This may help but it may also block a ‘learning organisation’ initiative.

Set up a series of Task Forces: Perhaps task forces could be set up to look at a number of the dimensions of the ‘learning organisation’ that you wish to pursue. This should be initiated at Army level, and the ideal place is at the Inspectorate Department. As per today they are the main body to monitor the Army’s standards and procedures. Task forces can function like action learning groups, and have sponsors to whom they are accountable, and perhaps also advisers who can support their work. There could be a ‘meta’ task force charged with overseeing the whole ‘learning organisation’ process. As temporary structures, task forces do not threaten the existing power distribution too much, and can mobilize large amounts of energy and creativity. Equally they should dissolve themselves when they have accomplished their goals or when resistance has stopped forward progress.

Run a Consciousness-Raising Development Programme: In seeking to ‘change their cultures’ many organizations have mounted large campaigns that have included significant training courses to get across the message of, for example, putting customers first, or ‘quality means getting it right every time’. This approach must have the board behind it, and can be very effective in the short term for raising energy and expectations. Problems usually occur with the question of what to do afterwards, and such an approach needs to be part of a grander strategy. To do this, the Army is seriously emphasizing the TQM culture at the various levels of command. A multiple case study done by Terziovski et al (2000), showed that TQM and the ‘learning organisation’ are mutually dependent, and they also found that TQM principles and concepts underpin the revolution of the ‘learning organisation’.

Work with the Strategic Planning Cycle: At several levels of command the orders given by the commanders have gone through a process of decision-making (appreciation process). This process makes the subordinate commanders learn to think logically and execute the plan they have made. In organizations where a strong commitment to a cyclical planning process exists, this might prove to be the right point at which to attach to a ‘learning organisation’ orientation. The link between planning and learning, and the professional performance of the Malaysian Army suggests that they have not let a new approach push the practicalities of soldier training aside. The final outcome still depends on the learned and practiced skills of individual soldiers.
trick of how to look upon planning as learning, are crucial factors here. Potentially, the planning has a say and makes a contribution.

**Begin with Diagnosis:** All good organization development intervention begins with data collection, analysis and diagnosis. The ‘learning organisation’ profile is one way of collecting data. However, a word of warning – ‘paralysis by analysis’ is all too common in such approaches and calling for more data is a favourite tactic of the status quo organization. Another problem is that of being swamped by information to collect. Our inclination is to commission an action and learn from it, and not to split the essential wholeness that is thinking and doing.

**Start with a Common Conference or ‘Teach-In’:** One way to involve representatives of the whole organization in an initial thinking or ‘tasting’ exercise is design a conference to introduce people to the idea and to involve them by asking for their opinions about the directions the organization should be going, and what problems they foresee in meeting targets and plans. Such conferences can be relatively inexpensive, small steps that none the less produce a lot enthusiasm and ideas. However, they can suffer from the shortcoming of other ‘consciousness raising’ approaches unless you have a good commitment to going further.

**Start With One Department:** There is no reason why one department should not make a start on the ‘learning organisation’ process by itself. Supposing the Engineer Regiment began to adopt this approach. If they succeeded in changing themselves and the way they worked together, then they would eventually ‘export’ this to the rest of the organization. For example, perhaps there would be different way of presenting the conduct of training and a different approach to training responsibility, together with a new service to internal customers from the regiment. Obviously there are limits to how far this could go without broader implications, but this could be a very practical place to make a beginning.

**Major on One of the Key Dimension:** An organization that wishes to follow a ‘learning organisation’ strategy could start by working on one dimension and forget about the others for the time being. For example, the development of a high quality learning climate or perhaps the spread of informative ideas, technology and software throughout the organization might make good starting places in particular organization. The place to start is where it makes most difference – although always with the big idea, the big picture, at the back of your mind.

**Conclusion:** The ‘learning organisation’ is a continuous and life-long process. This is not new, and has been in many early writings on organizational development and change. The literature on the ‘learning organisation’ has not stopped the flow of it, which is extensive and expanding rapidly. Presently, as a concept and ‘must be’ organizational vision, it is located somewhere on the path from invention to innovation. The ‘learning organisation’ is a commitment of all the organization’s members.

At the practitioner level there remains the issue of whether it is possible to create a ‘learning organisation’ in the Army. Just another personnel observation: With 26 years of experience, the author tends toward the view that it is perhaps more useful to consider the ‘learning organisation’ in terms of organizational values processes that adopt a learning–based approach, than in terms of specific learning structures and interventions. However, the detail study should be done to analyze the level of learning in the Army today. Many of the issues raised by the ‘learning organisation’ are equally relevant in the context of the management of change and the introduction of continuous improvement and other quality initiatives. ◆

**References:**

The focus of this paper is on the merging of new and emerging technologies and the evolving African Operational Environment.

A broad definition of technology is used, one that includes hardware, knowledge and processes, as well as the cultural aspects of technology.

The African environment is approached from two perspectives, a worst case and a best case perspective. It speaks for itself that relevance of emerging and new technologies will differ vastly in these two cases.

In a worst case perspective it is noted that the military is mainly utilised in peace keeping, to protect the governments of the day against their own citizens, or in the warlord-type warfare to gain (or retain) control over resources. In the best case perspective the military emerges to a modern capability to protect the sovereignty of the country and fulfil its other strategic mandates.

Points of Departure
Important points of departure for this paper are:

1. Africa has a unique approach to warfare shaped by generations of warring nations and tribes who were not primarily informed or shaped by Clausewitz. While many military leaders (or at least movers and shakers) in the military environment in Africa had their training in other countries with a more institutionalised approach to the military, this knowledge is integrated with a largely oral tradition and knowledge. This oral tradition

Light special forces vehicles like this New Zealand SAS Pinzgauer are, arguably, just a formal version of the ‘technical’ and can prove very useful in the right environment.
is largely inaccessible to outsiders, which adds to the unpredictability in Africa, at least for those who observe from the outside. Furthermore, the ethics of warfare in Africa has its own nature, making it difficult to engage with a typical western approach.

2. **Africa has a unique take on technology that allows for innovative application and invention not easily grasped (or countered) by more structured approaches**. ‘Obsolete’ warfare technology and approaches happily co-exist with new technology and approaches in Africa, making it possible to come up with innovative combinations that are difficult to predict or foresee. This coexistence is often further exploited by innovative integrations of ‘old’ and ‘new’ technologies, which provide unexpected capabilities. Another factor is that Africa does not have a legacy of existing warfare equipment and processes, so that the acquisition of the latest technology on short notice is possible. This adds to the unpredictability.

3. **Volutility is a given in Africa for quite some time to come, coupled with sudden change**. This is about the only certainty one can have about Africa’s future. Given the fact that Africa has a very young history of democracy, and that most countries in Africa gained independence 50 years ago or even more recently, it is almost a trivial statement that Africa has not yet developed into a stable continent where there are perceivable and fairly certain trends. In fact, recent events in Africa once again highlighted that the status quo can be very fragile and easily destabilised. This makes any projection into the future in the African context even more uncertain than usual.

These points of departure are explored against the observation that Africa is currently able to defend its resources and commodities primarily because of its unique environment, unique warfare culture and demanding infrastructure realities. Should any of these change (and the quest for development is bound to change them), Africa can easily become more vulnerable even as it gains a more professional and modern military capability. In fact, it is possible that modernisation can become the biggest driver to decrease the African ability to defend and protect its resources. We can at best become a small player in mainstream military technology if we follow the path paved by the rest of the world, becoming by definition vulnerable to the big players (who are hungry for the African commodities). Military modernisation therefore needs to be approached with caution and managed carefully. This is one of the main points that this paper endeavours to make – to caution against losing the current (very effective) deterrent factors as Africa develops, without having the ability to become a big player in the world and defend itself effectively in the more traditional military sense.

**Approach to the Future**

Against this background it is immediately obvious that it would be unwise to develop detailed plausible futures that can be used to project the relevance of emerging technologies in the usual way. This does not make the task of commenting on the relevance of emerging technologies for the future army in South Africa impossible. Rather, it provides unique opportunities:

1. **Resilience has to be a primary focus**: In not being able to have the clarity that can be presumed in more stable situations, it becomes immediately obvious that having the ability to survive (and thrive) in the unforeseen, is a capability that has to feature strongly in any meaningful evaluation of technology – are there technologies that would enhance the ability of the army to survive (and thrive) in the unforeseen?

2. **Innovative Warfare**: Accepting that there are many more combinations of possibilities in a volatile environment, the ability to be innovative in thinking and applications need to be sought-after capabilities to develop and exploit this reality as a resource. Are there technological developments that would enhance the army’s capability to be innovative during operations, and to combine that creatively with more classical approaches as required?

These two guiding focus areas need to inform our ongoing scan of new technologies. They are, of course, not new in warfare thinking, neither are they unique in Africa. They are worldwide trends in warfare thinking, often specifically to exploit the information and knowledge sciences. Making them primary focus areas for direction of future capabilities at the cost of more classical development paths is, however, not the norm, but this paper argues that in the African context this might be the best option to pursue given the background as already stated above.

*The ‘technical’ is an African solution to the problem of providing mobile firepower – and works. The term comes from aid officials expenses claims, in which bodyguards were listed as “technical advisors”.*
Important Technology Areas to Take Into Account
Looking at emerging and new technologies and their possible value in the future military landscape in such an environment, and with a focus on these two focus areas for warfare capabilities, the following is noted:

1. **Africa provides for a mix of old and the very latest technologies in new and innovative ways without having the legacy of expensive systems that need to be maintained.** While this lack is a challenge in many respects, it also allows for African use of technology in warfare to jump S-Curves of technological development and provide innovative applications of ‘obsolete’ technologies as they are integrated with the latest developments in hardware, knowledge and warfare thinking in Africa. This provides a rich set of possibilities that can be explored, and technologies that would enable exploiting unique or more such combinations should be pursued.

2. **Modular, mobile, asymmetric warfare is a way of life in Africa.** This places a huge demand and raises legitimate questions about processes of acquisition and the requirement for affordable, modular, mobile, and flexible technologies to be used in a variety of configurations. Technologies that would enable not only the sharp end, but also the support systems to conduct operations in this fashion, should be pursued.

3. **While often not popular in current thinking, technological investments that would ease the logistical problems raised by the requirement for sustained mobile operations in Africa can make a decisive difference between successful and unsuccessful operations.**

4. **Absorption of new technologies in biological sciences, MEMS and nano sciences can possibly find acceptance for warfare purposes in Africa sooner than in the First World, because of the ability of Africa to ‘jump the technology S-Curves’, which makes these developments of much interest to military thinkers about defence in Africa. They should be studied closely, as the year 2020 is far enough for some real applications to emerge.**

5. **Autonomous, unmanned technological developments specific for warfare are of much interest in Africa, and could possibly pose a significant threat to African countries in years to come, especially if a ‘worst case’ African scenario develops. At the very least, one has to assume that this would be a preferred way in which Africa is engaged in warfare, so that effective counter measures are important.**

6. **Space War and Space Technologies.** Coupled with precision weapons and unmanned autonomous surveillance, space war also presents Africa with unique challenges. At the very least we need to know that we have the necessary counter measures in place, because once again this type of warfare allows for a type of warfare that could break through the most basic defence that Africa currently has – the lack of infrastructure necessary to sustain large traditional operations.

In addition to these, the developments in information, communication and knowledge technologies need to be studied and understood, since they provide the backbone for future warfare thinking and doctrine.

This is a minimum set, by no means an exhaustive set, of technologies to take into account.

**Diversity and Strength as Summarising Focus on Technology Engagement**

The main strength, currently mainly untapped, of the African approach to both warfare and technology is the fact that the diversity of approaches and diversity of cultures do provide for a unique environment for innovation. To my mind it is here that Africa will find her niche to retain her ability to defend herself as she develops. But this requires that we apply our best minds to retain and enhance our unique take on both technology and warfare – to the best interest of all our peoples. The best way Africa can lose the battle to effectively protect herself is to ‘westernise’ its warfare capability and become a small fish in a big pond. This does not mean that a lack of development should be pursued, but rather that the innovative, mobile, asymmetric nature of African warfare thinking and practice should be developed to its full potential for the benefit of the people of Africa.

As much as this presents challenges in terms of hardware, it also presents challenges in terms of warfare and support processes and human skills. These need to be developed together in a balanced fashion for the South African Army to be effective in executing its mandate into the future of both South Africa and Africa.◆
Olifant MK2 main battle tank - the new paradigm in South African tank warfare

Major S.F. Van Graan
SO2 Administrative, Operating and Technical Policy, SA Army Armour Formation HQ

The more aggressive MK2 MBT: currently being commissioned by 1 SA Tank Regiment in Bloemfontein. Formal training commenced early in 2007.

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Introduction
Main battle tanks are multi-role, versatile assets of an army. Continuous upgrading (the implementation of improved technology) enhances their adaptability with regards to an ever-changing world. Enhanced capabilities, with specific reference to equipment, are often the key that unlocks new perceptions, possibilities, opportunities and, ultimately: roles and missions.

The paradigm shift with regards to the future tactical employment of main battle tanks (MBTs) in the SA Army should be read in conjunction with the SA Army Armoured Corps’s philosophy: “Armour is not a specific weapon system, but a concept, a state of mind, an approach to combat that stresses firepower, manoeuvrability and shock effect”. Add flexibility, protection and good night fighting capabilities to this concept and you have the complete conventional combat package.

The Olifant Mk2 MBT is an upgraded version of the Olifant Mk1A MBT and is currently being commissioned by 1 SA Tank Regiment in Bloemfontein. Formal training on the Mk2 commenced early in 2007 at the School of Armour. Training on the Mk1A will continue until the end of 2009. The new capabilities of the Mk2 (especially its enhanced speed) enabled the SA Army Armoured Corps to reconsider the validity of established paradigms in order to develop new doctrine for its MBTs. It includes aspects such as the advance, offensive, defensive and retrograde operations.
WEAPONS & EQUIPMENT

Aim
A deliberate effort was made to develop a new way of thinking and employing MBTs, due to the fact that the existing doctrinal paradigm is as obsolete as the equipment being replaced. Therefore, the aim of this article is to give perspective on the paradigm shift with regards to the future tactical employment of MBTs in the SA Army.

Olifant Mk1A MBT – An Overview
The Mk1A was the previous mainstay of the SA Armoured Corps’s tank capability. Doctrine was rigid in that the smallest unit, in which they could be employed, was a squadron, consisting of three-tank troops. It concentrated on high intensity operations by means of deliberate attacks on static defensive positions, while its night fighting capabilities were limited. With regards to squadron and troop commanders, initiative and mission command was non-existent. During the past decade the Mk1A became obsolete with regards to its manoeuvrability, survivability, general capabilities and, more important: doctrine.

Olifant Mk2 MBT
Upgrading
The Mk2 is a well-balanced system with regards to:
- Firepower.
- Manoeuvrability.
- Survivability.
- Man – Machine Interface.
- Maintenance.
- Night Fighting Capability.

Firepower
The Mk2 has a hunter – killer capability. Its integrated fire control system (IFCS) can track targets moving up to 120 km/h. The commander’s observation platform (COP) is, like the main gun, stabilized, and can register targets in advance that reduce the crew’s reaction time. The driver’s passive night sight was also upgraded while the COP is fitted with a thermal imaging system (TIS) that enables the crew to engage static as well as moving targets at night.

Manoeuvrability
For the first time in the Republic of South Africa’s history, the Army has a fast, highly manoeuvrable heavy tank. The Mk2’s mobility is enhanced by means of an improved power pack and hydraulic suspension. It handles much better than the Mk1A (making, for example, pivot turns). A smoother ride provides a more stable platform for the main gun, needed for accurate firing on the move. The Mk2 provides a better cross-country performance and ride comfort than the Mk1A.

Survivability
The Mk2’s protection was improved by four tons of add-on armour. The turret and hull can withstand direct medium calibre fire (from 100 m away from any direction). It

Olifant Mk2 MBT – Data

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Capacity</td>
<td>1260 litres</td>
</tr>
<tr>
<td>Drinking Water</td>
<td>135 litres</td>
</tr>
<tr>
<td>Vehicle Mass</td>
<td>60 500 kg (combat loaded)</td>
</tr>
<tr>
<td>Bridge Classification</td>
<td>70 000 kg</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>60 km/h</td>
</tr>
<tr>
<td>Engine</td>
<td>V12 (turbocharged, inter cooled, air-cooled, diesel)</td>
</tr>
<tr>
<td>Maximum Gradient</td>
<td>60%</td>
</tr>
<tr>
<td>Trench Crossing at 30 km/h</td>
<td>2,0 m</td>
</tr>
<tr>
<td>Fording</td>
<td>1,5 m (unprepared)</td>
</tr>
<tr>
<td>Rate of Fire</td>
<td>6 (rounds per minute)</td>
</tr>
<tr>
<td>Main Armament Ammunition</td>
<td>64 x 105 mm rounds (APFSDS/T, HESH, HE/T, WP)*</td>
</tr>
<tr>
<td>Secondary Armament</td>
<td>Browning machine gun (3200 x 7,62 mm rounds)</td>
</tr>
<tr>
<td>Radios</td>
<td>C21, B46 and HAR 600 intercom system3</td>
</tr>
</tbody>
</table>

*APFSDS/T: Armour Piercing Fin Stabilised Discarding Sabot with Tracer
HESH: High Explosive Squash Head
HE/T: High Explosive with Tracer
WP: White Phosphorus
provides protection against a double TM-46 mine explosion, complemented by enhanced fire/explosion protection inside the fighting compartment. It also provides protection against the airburst of a conventional 155 mm M1 artillery round, as well as the standard RPG-7 grenade fired from any direction or distance.3

Man – Machine Interface
The Mk2 has an improved driver’s and fighting compartment. The ergonomics inside the fighting compartment was improved by means of a new gunner’s and crew commander’s panel, better space utilization and interior cooling fans. This user friendly fighting compartment ensures a more comfortable operating environment for the crew.

Maintenance
The Mk2’s maintenance is drastically reduced (example: 147 grease tasks on the Mk1A were reduced to zero on the Mk2).3 Another interesting fact is that the Mk2 only makes dust at the rear and sides, not to the front anymore; therefore the crew’s vision is not impaired while the driver’s and fighting compartments stay relatively clean.

Surprise and Shock effect
The Mk2’s increased speed ensures better tactical movement. It is able to move and switch positions more stealthily (less diesel-smoke and dust). It can combine accurate fire with high mobility, that enhances its high intensity combat capabilities. The Mk2 is also able to execute night operations – another first for the SA Army tank capability.

Flexibility
In order to live up to one of the Armoured Corp’s most important characteristics (flexibility), the four-tank troop was introduced.4 Tank troops will be much more flexible through the implementation of the "wing man" concept (tanks operating in pairs within a troop). Tanks operating in pairs will enhance the successful outcome of meeting engagements while troops do not have to stay within range of each other on the battlefield anymore. Tank troops will also, if needed, be attached to tank-heavy combat teams/groups, thereby hugely strengthening their combat capabilities.5

With regards to squadron and troop commanders, initiative and mission command will be much broader in order to test new ideas and techniques. “What to do” rather than “how to do” will be the approach with regards to future armour operations.6 Troop commanders will therefore, like their armoured car counterparts, be trained to navigate. Better vision to the front and sides enable drivers to assist crew commanders in the forming up and changing of troop combat formations, while loaders must assist crew commanders with navigation.7 The four-tank troop enables troop commanders to choose between more variations of troop combat formations for more situations, in comparison to the few of the three-tank troop.5

Due to the fact that a larger area will be dominated by a squadron; not only the squadron commander, but also the second in command will be placed at the front in order to become more involved in the battle, and, if needed, take over command more fluently.8 The tasks of the squadron second in command during the battle (handling of personnel/vehicle casualties, logistical needs and controlling the squadron headquarters grouping) will be taken over by the squadron rear liaison captain, the “third in command”.2

Squadron laagers will be more tactical. Passive defence will be enhanced in that A-echelons will not form part of laagers anymore. The mixing of tanks and logistical vehicles in a laager becomes too risky and downright dangerous in the modern battlespace. Replenishment will therefore be done before a laager is taken in, not inside. Future squadron commanders will have the opportunity to choose between normal laagers as we know it, as well as scattered and battle laagers.4

Scattered laagers entails that a squadron’s troops are “scattered” over a wider area in order to enhance its passive defence against enemy air/artillery attacks, while battle laagers are utilized when a squadron’s troops literally stop in their advance formation. Each troop only moves slightly “out of formation” to the nearest tactical position in order to form up easily and instantly when the advance continues again.

Tactical Employment
In order to breach the previous rigid paradigm with regards to tank employment, new doctrine, principles and concepts are being developed in order for the tank to become the centrepiece of the SA Army’s conventional doctrine. Tank squadrons are designed to execute high intensity operations, usually the final destruction battle during the last phase of an operation.8 The Mk2, with its enhanced mobility, provides better agility. Better manoeuvrability enhances the gaining of tactical advantageous positions. Operations can therefore...
be executed at a higher tempo (carrying the battle forward more easily and concentrating force more readily at different places) that can result in a more decisive outcome. Tank troops will complement such operations by being employed more intelligently to fulfil a wider range of missions.5

Apart from being employed as assault groups only, troops in depth can also be employed as direct fire support, flanking and/or cut-off groups, for example: a tank troop, attached to a tank-heavy combat team, can be employed as a direct fire support group, without the squadron loosing its depth element.5 The squadron second in command can also be appointed as the commander of the direct fire support group, consisting maybe out of a tank and long-range anti-tank missile troop (like the Ratel ZT3A2). The firepower of five tanks and four long-range missile systems from a direct fire support base will be devastating!5

During defensive operations tank troops will execute spoiling attacks, counter-attacks and ambushes.6 Tank squadrons or troops will be able to execute convoy protection missions during the transportation of critically important equipment and logistical needs.4 Tank troops will act as leading, flank and/or rear guards (one or two troops) for tank- heavy combat teams/groups during the advance or retrograde operations.2 Due to the fact that tank troops will be more dispersed within a much wider area than before, their passive defence against air attacks (especially attack helicopters) is enhanced.5

Because of the Mk2’s thicker armour and better firepower, it is better suited for the direct fire support role than the Rooikat armoured car. Because of the Mk2’s superior critical mobility, it is also able to gain positional advantage faster than the Rooikat.5 Therefore it enables combat team/ group commanders to free the Rooikat armoured cars from the immediate battle (they are usually employed as direct fire support groups) in order to employ them in their primary role of high mobility operations, including aggressive reconnaissance and raids.

On Tanks in General

Shock effect

The success of tank operations is enhanced by the obtained shock effect on the enemy. Shock effect is the physical impact (weight/size/momentum) and psychological effect (fear/panic/paralysis) created by the aggressive employment of armour (especially tanks). The tank, as a unique weapon system, can deliver accurate stand-off as well as close combat fire. Rapid manoeuvring combined with accurate, concentrated...
and overwhelming fire will therefore create the desired shock effect.4

Urban Warfare
Although urban or built-up areas (cities) are considered to be the future battlegrounds, tanks are still generally regarded as not suited for urban warfare. Recent wars, however, proved this perception wrong. The American and British experience in Iraq showed that the tank, employed in a close fire support role to dismounted infantry, was greatly welcomed by the infantrymen concerned. In Iraq, the Abrams’ thick skin proved immensely valuable in fending off enemy tank rounds, rocket-propelled grenades and roadside bombs (improvised explosive devices) that crippled lighter vehicles.8

During all military operations, protection is important. Therefore, tanks are suitable to urban combat due to the fact that they are hardest to kill. Ground forces must provide their own protection, critical mobility and firepower in urban areas, which calls for the extensive employment of MBTs. Tanks provide better protection than any other combat arm.6 It can move and manoeuvre in the face of fire to a larger extent than any other arm, without necessarily firing back.6 Tanks have the smallest turning circles of all military vehicles and are therefore suited to move even through the sharpest corners.

In urban operations, tanks will also work in pairs (within a troop), while mutual support between them and dismounted infantry will be crucial. Apart from close fire support, tanks (fitted with dozer blades) can remove burning wrecks, rubble and debris; clearing the way for the infantry to do building clearing operations. MBTs in the vicinity will therefore always make a difference and do have a place in future urban operations.5

Peace Operations
The primary role of MBTs will always be the conventional defence of the RSA against external military aggression, but if the SANDF is required to assist, whether in peace keeping or in peace enforcement operations, it can play a major role. Tanks, as a force multiplier, greatly enhance the effectiveness of other arms, especially infantry – which increases at least tenfold. They can, as a result of good mobility and communications, dominate large areas with little personnel.9

Tanks provide a rapid, visible dominance, that belligerents must take seriously. They are immune to almost anything that can hurt or kill an infantryman. With regards to the protection of convoys, checkpoints and important installations, the four-tank troop is ideal. Armour is already useful in peace keeping operations, therefore tanks will be essential in peace enforcement operations.10

The African Battlespace
Mobility is the ability to move freely and rapidly over terrain of interest in order to accomplish a variety of combat objectives. The road network and infrastructure in Africa is generally inadequate. The nature of the terrain and surface in Africa (open and well negotiable terrain, closed to bushy terrain) also varies from season to season; therefore tracks offer the best solution when operating within this vast battlespace.8

With regards to asymmetric warfare, the South African Armour doctrine states that tanks are multi-purpose vehicles that operate best in a tank-free environment. As discussed before, the idea that tanks are designed to fill a very narrow spectrum of battlefield utility and that their only purpose is the final destruction of the enemy during conventional warfare is misplaced.6

A last thought: In all types of warfare/conflict, there will always be some kind of firepower, the need to move and manoeuvre, as well as the need to survive. The combination of firepower, mobility and protection (within tanks), therefore makes military sense!

Conclusion
While there was an urgent need for a paradigm shift with regards to the tactical employment of MBTs in the SA Army, there is also an urgent need for the complete renewal of the SA Army’s main battle tank capability beyond the Mk2, but that is another topic.

Not to move forward with regards to doctrine is to stagnate, and to stagnate is to fall behind and be left behind, therefore moving backwards...

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Simulation: the development and use of off-the-shelf PC games for military training

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INTRODUCTION

BACKGROUND

Personal computer (PC) based games bought commercially off-the-shelf (COTS) have been used by armed forces as training kits since the late 1990s, although efforts to use video games in armed forces started as early as the 1980s. A small number of specific PC games are used to enhance basic warfare skills or are tailored to meet specific training needs. One of the first COTS games used for military training was Doom II which was adapted in 1996 by the United States (US) Marine Corps to develop Marine Doom as a tactical training tool. This was later used to also teach mutual fire support, ammunition discipline and tactical leadership. In addition to achieving certain cognitive objectives, PC games are increasingly used to save training costs, for example, driving a tank can cost up to R600-00 per hour, while training with a tank simulator can cost as little as R24-00 per hour. PC games are appealing not only for training, but also for their adaptability and many uses. PC games are also used by armed forces as marketing tools for recruitment and public relations. The US Army, for example, developed a game called America’s Army, based on the single/team shooter game Counter-Strike, to portray the values of soldiers in the US Army. The advances made in computer graphics, sound effects, networking and teaming capabilities provide more convincing reasons to use PC games more prominently as training solutions. In addition, the internet can facilitate training across continents and establish training sessions between students and experienced soldiers in-theatre.

While armed forces make use of PC games for training, the availability of data for their evaluation is limited, and armed forces have to make deliberate efforts to conduct scientific studies in this regard. While PC games are useful training instruments with many advantages, they also have their shortcomings and limitations, as identified in available studies. Armies need to be aware of these aspects to ensure that PC gaming is used effectively in addition to live simulation and field training. In this paper available research on the usefulness and limitations of PC games for military training purposes receives attention.
**AIM**
The aim of this paper is to discuss the development and use of PC games for military training with particular reference to tactics, techniques and procedures (TTPs).

**SCOPE**
In the first part of the paper the term simulation, as well as the types of simulation is clarified. Thereafter an overview of the development of simulation towards modern PC-based simulation is given. This is followed by highlighting the importance of using PCs for training the so-called wired-generation in armed forces. The advantages and disadvantages of PC-based simulation training are then discussed with some recommendations on how to use PC-based simulation optimally for military training.

**CONCEPTUAL CLARITY ON SIMULATION**
Before discussing simulation the term will be clarified. Simulate refers to imitating or reproducing the appearance, character or conditions of something similar to reality. Computer simulation can be defined as the technique of representing the real world by a computer programme. A simulation should imitate the internal processes involved and not merely the results of the thing being simulated.

There are four types of military simulation: PC based, constructive, virtual and live:

PC-based Simulation. Various types of PC games are used in the military for simulation training. A simulation game involves a mixture of skill, chance and strategy to simulate an aspect of reality. Simulation gaming has its largest application in the world of computers with people learning by simulation. It has been used extensively as an effective way to generate new and more complex behaviour among participants (eg to engender courage among participants exposed to fearful conditions). When used effectively, simulation gaming can produce results which eclipse many other forms of training.

There are different kinds of PC games used for military training, but one of the most common games is the tactical shooter which is also known as soldier sims. A tactical shooter is a subgenre of video games derived from the first-person shooter (FPS) or third-person shooter genres that generally simulate more realistic, squad-based or man-to-man skirmishes. This may come in the form of police fighting terrorists or other criminals, military combat in the recent past or hypothetical near future, and so on. The emphasis is on the realistic modeling of weapon effects, terrain, and character capabilities; this leads to the possibility of other tactics, such as stealth being used in play rather than more conventional gameplay which emphasises overt individual heroism.

A multiplayer tactical shooter focuses on team cooperation to achieve objectives, rather than simply eliminating the enemy (as in traditional deathmatch games). The tactical emphasis is thus on joint goals and assisting team members, rather than individual skill and heroism. Games of this nature include Counter-Strike or Wolfenstein: Enemy Territory.

Virtual Simulation. This is the replication of warfighting equipment and munitions on a shared terrain database on which collective training can be conducted, and has potential links to live or constructive modeling and simulation. Virtual training therefore involves training in the use of computer generated battlefields in simulators with the approximate physical layout of tactical weapons systems and vehicles. An important characteristic of virtual training is that the terrain information is presented as a three-dimensional view that...
approximates the view seen from actual equipment, whether it is through the window or using other sensors.

Constructive Simulation. Constructive simulation can be defined as models, simulators, and/or simulations that involve real people making input into a modeling and simulation entity that carries out those inputs by simulated systems. Constructive simulation is generally used to exercise unit command and staff functions at any echelon. The Battletech system used by the former CyberSim is an example.

Live Simulation. Live simulation involves training executed in field conditions using tactical equipment, enhanced by training aids, devices, simulators and simulations. For example, soldiers can use actual weapons and prime mission equipment with sensors, lasers and man-pack speakers to exercise blue-on-red exercises with significant reality with the assistance of a central computer system monitoring and displaying the exercise for debriefs.

AN OVERVIEW OF THE DEVELOPMENT OF PC-BASED SIMULATION

One of the earliest examples of simulation in the military was von Reisswéitz’s Kriegspiel which was developed and used the Prussian military in the 1820s for the training of officers. It established conventions for wargaming and umpires, as well as fundamental rules for movement and combat resolution. The US military imported it in the 1880s for use in the US Army and later in the US Navy for war gaming. The game was developed further among the war colleges of the US and Europe. From these wargames, commercial board games and miniatures were developed. These games shifted the mechanics of game design from abstract strategy and chance to an emphasis on historical realism defined by systems of rules and data. The US Department of Defence has been one of the primary proponents of wargame design since the 1950s.

Simulations Publications Inc (SPI), owned by James F. Dunningham, was one of the first companies that refined and popularized wargames simulations and became the leading publisher of commercial games. In 1976, SPI published Firefight, a game that simulated Soviet and US small unit tactics. It was the first important title in a series of games that looked at future combat. Dunningham developed this game with then Lt Col Ray Macedonia of the US Army. Macedonia was determined to improve the reality and utility of games for military training by means of design advances, as well as improved research standards and modeling.

Dunningham and Macedonia worked together to exploit the potential of computer-based war gaming. After the first of several international conferences on wargaming in 1977, the US military gave SPI a contract to develop a strategic wargame called SAS (Strategic Analysis Simulation) by 1980, to enable commanders to test the outcome of various strategic decisions. The tactical module of SAS was updated with data from the Falklands War in 1982.

The US Army encouraged more detailed simulations in the 1980s. The increasing expense of traditional (live) exercises focused attention on the resource efficiency of simulations. The potential savings was one factor that expanded the scope of game designs in this period, particularly in linking different levels of simulation, such as individual tanks and higher-level unit commands, or operational and theatre level of command. This later enabled the development of “disruptive interactive simulations” (DIS).

The next step in the development of simulation was the development of distributed networks. The high cost of specific task-training simulators such as flight simulators became unacceptable to military decision-makers. A flight simulator for landing aircraft on an aircraft carrier was almost the same price, or even more expensive than an aircraft itself. As a result, technology development in the private sector was encouraged.

Steel Beasts also enables the training of junior leaders at troop/platoon level, as well as squadron/company level individually or networked.

The focus on affordability led to much creativity in simulation development. The emphasis fell on selective functional fidelity, rather than full physical fidelity which resulted in non-essential hardware of prime mission equipment being removed from simulators. This approach was applied in 1982, when the US military started with a project to develop a network of tank simulators for collective training, later called SIMNET. This project, however, faced many challenges with integrating the visual displays, the network architecture and the DIS within the cost-constraints. Boeing then made a proposal to take advantage of new generation microprocessors for developing a new low-cost computer image technology for visual displays which eventually succeeded. This enabled simulation designers to put microprocessors in individual tanks with...
their own visual scene of other vehicles and the terrain of the battlefield. The success of this resulted in the development of prototypes of SIMNET between 1987 and 1989, and the first simulators were operational in January 1990. SIMNET enabled US commanders and armour/mechanised crews to log hundreds of hours on simulations before engaging Iraqi forces during the Gulf War.

The value of using computer-based wargames as predictive models for combat was demonstrated convincingly before the Gulf War in 1990. General Norman Schwartzkopf and his headquarters staff at the US Central Command (CENTCOM) prepared for a potential conflict in this theatre by playing scenarios of the wargame Operational Internal Look which was designed by Gary Ware. This game integrated cartographic and military data. When Iraq invaded Kuwait in 1991, CENTCOM used the game to run variations on the actual development of the campaign. The programme was used successfully to forecast the unfolding of the air and ground campaign. It also enabled planners to formulate defensive plans from previous lessons learnt by means of simulations.

At the end of the Cold War, armed forces became compelled to become more fiscally efficient based on practices of sound business and making military procurement practices interface with commercial industrial manufacturing processes. One of the business principles was to use COTS systems instead of developing tailored systems with the defence industry. Although some of these business principles damaged the functioning of several operational logistical systems, it benefitted the development of cheaper technology for simulation. Adapting technology development and acquisition to the fast-paced high technology sector of the US economy meant adopting simplified, flexible management processes found in commercial industry, including the institutionalization of integrated product teams, treating costs as an independent variable, and implementing a paperless procurement system of electronic commerce by the year 2000. The military SIMNET and the entire field of computer simulation and training was an immediate beneficiary of these economic trends in policy. The emergence of the military entertainment complex has been a direct outgrowth of the new emphasis on simulation and the reorganisation of procurement. It also encouraged further research and analysis to look at other commercial markets such as PCs and graphics workstations.5

The development of DOOM II and Falcon4.0 by ID Software and Spectrum Holobyte respectively, demonstrated the impact of commercial games on military war gaming. Both these games were adapted and later used for simulation training. DOOM was first released in December 1993 as a “first-person shooter” game. It was a phenomenal success and established competitive multiplayer gaming as a leading genre of PC games. The game had a superior graphics engine, fast networking for multiplayer gaming, a modular design that led authors to create new levels and a new mode of competitive play. The game demonstrated that PCs could produce smoothly scrolling graphics. One of its programmers, John Cornack, focused on three-dimensional graphics and wrote the graphics engine for games such as Wolfenstein 3-D which set the stage for DOOM II.

In 1996, Marine Commandant Gen Charles C. Krulak issued a directive aimed at implementing improvements in “….military thinking and decision making exercises”. Krulak wanted marines to learn to think, make decisions, and be exposed to tactical and operational issues. His concept for achieving this highlighted the use of technological innovations such as PC-based wargames, especially when live training opportunities are limited. He also made provision for using approved games on official PCs.

The Marine Corps Modeling and Simulation Management Office obtained a shareware copy of DOOM and began experimenting with it. The game was then adapted as a fire team simulation with some of the input for the Marine version coming from Internet DOOM gamers who employed shareware software tools. They rewrote the game code and scanned into the game graphics with images of standard service weapons, enemy soldiers, as well as fighting holes, bunkers and tactical wires. The commercial game had to be purchased to make the game work. The success of this project led to the later design of a tactical operations game built to specifications for the Marines by MÄK who also sold the game commercially as an official Marine Corps tactical training game. The technologies that MÄK’s developed became known as DIS.

Military simulations have been deeply embedded in commercial forms of entertainment, for example, by providing content and technology deployed in computer and video
games. Towards the later 1990s the US government spent $500 million on optimizing the speed and capabilities of DIS and high level architecture for games. Companies such as MÄK made use of this investment to their own benefit. This relationship between armed forces and software companies provides mutual benefit. As a mass market, games now drive the development of graphics and processor hardware. This market is driven by young people who grew up with PCs.

THE WIRED GENERATION

The era of the information age has changed the way young people learn. This affected both the X-generation (those born after 1974) as well as the younger wired generation (today’s teenagers). The wired generation grew up with internet, PC games and sophisticated television games. This exposure changes the way young people learn and prefer to learn. This affects both academic institutions and armed forces alike in the way they have to adapt their methods of education and training.

The wired generation in particular is very different in terms of skills and attitudes than its predecessors. The characteristics of the typical wired generation include:

- The ability to perform several tasks, such as listening to music, talk on a mobile phone and use the computer, all at the same time.
- Attention span variation, exhibiting fast context switching.
- Information navigation changes that define literacy not only as text but also as images and multimedia.
- Shift in focus of learning from passive listening to discovery-based experiential and example-based learning.
- Shift in type of reasoning from deductive and abstract to the concrete.

According to McCallister, the exposure of the X and wired generations to modern information systems and computers make them very comfortable to operate in a simulated environment and particularly receptive for PC based training.

Computers are increasingly used in armed forces for administration and management. In their daily routine, many soldiers work closely with computers and are familiar with their use. The way in which young people learn, as well as the increasing dependence of armed forces on PCs, presents an opportunity to make extensive use of PC based training and simulation.

CURRENT TRENDS AND STRONG-POINTS

The use of PC games for military offers many advantages for armed forces. In this section these advantages will be discussed, as well as the trends in using PC games for military training.

Commercial OTS PC games can be used or modified to provide useful advanced training solutions at a fraction of the cost for developing unique military systems. For example, a US Navy preflight student, Ensign Herb Lacy, bought a copy of a Microsoft game called Flight Simulator for about $50. He then modified the programme to recreate the appearance and controls of a T-34C Turbo Mentor, which the US Navy uses for primary flight training. The total cost was less than $250. With this programme, Lacy logged 50 hours of flight time on his personal computer before he ever climbed into a real T-34C. The US Navy was so impressed with Lacy’s accomplishment that it has begun operating six makeshift T-34C simulators, using the same software, at a cost of $6,000 each, compared with millions of dollars for conventional simulators. PC games can be modified at little expense to suit the needs of armed forces and in the process save much in training costs.

Cost is an important consideration for using PC based simulation. Most modern weapons are so extremely expensive to use that most training must be done without full-scale operation of the whole weapon system. The constant decline in simulation technology and computer hardware has made PCs more affordable. COTS simulation is then generally a cheap substitute for reality.

The subsequent studies on the use of Flight Simulator by US Navy student pilots indicated that 54% of those students who used it at home or in early flight training, achieved higher scores than students who did not exercise on the programme. The use of PC games can therefore aid in developing advanced cognitive and motor skills.

One of the biggest spin-offs of using PC games for military training, was the development of networked non-commercial military training software. One of the first programmes developed was for networked armour combat simulation.
(a programme similar to Battlezone) which heightened the interest of militaries in PC gaming. Networked games such as Land Warrior are developed to integrate a self-contained computer with a radio system, Global Positioning System receiver, a helmet-mounted liquid crystal display, thermal and video sights, laser ranger finder and an assault rifle.

Another attraction of simulation is that it is safer than field training. Many skills that soldiers have to acquire involve the use of expensive equipment, and action in dangerous situations. Novices cannot be allowed to use real equipment; they would be a danger to themselves and others. The increasing use of simulation devices is playing a significant role in improving safety in general, particularly in aviation. For example, the accident rate for aviation in the US Navy has fallen from 20 per 100,000 flying hours in the 1950s to 2.39 per 100,000 after recent counts.11

Simulation can facilitate valuable training for activities which cannot be practised in the real world12. For example, in a scenario military team leaders can encounter a hostile force of such complexity that it cannot be recreated in an exercise area. Another example is the ability to land at any international airport with Flight Simulator. PC based simulations can therefore provide high levels of reality in unique situations because of the special training conditions they can create.

According to Avella, simulation will enhance and expand traditional training, but will never replace live training entirely.13 The physical demands of operations must be exercised during live training.

SHORTCOMINGS OF PC GAMES FOR MILITARY TRAINING

In this section of the paper several shortcoming of PC games for military training are discussed. In addition to the difficulties, some practical solutions are highlighted.

Computers cannot fully analyse the progress and performance of students, or always evaluate them against some tactical standard.14 Human instructors are therefore always required for feedback and they carry the main responsibility for training students. The data of results and feedback after a simulation exercise, are usually vital determinants of the success of PC based simulation. Soldiers must learn by trying various actions and decisions and see the consequences within the context of the aim of the exercise.

Most PC games for single or multiple shooters are designed to keep expert gamers and communities occupied for a long time. As a result, there are many options, missions, levels, scenarios, tools, weapons, and personalities that users must filter through and select. This often makes PC games sophisticated and difficult. To interpret and prepare a scenario for a military class or practise session often requires a gaming expert to familiarize the soldier under training with the system.15 The sophistication of PC games may require extensive introductory training to familiarize students with a programme.

An effective solution for facilitating training with complicated PC games, is to have an expert gamer develop a game map in order to save instruction time. A game map should reveal, in hierarchical form, a graphical presentation of each step of setting up all possible options, scenarios, missions, teams, etc. With this pictorial presentation, the trainer can easily match the training requirements to the potential game materials, options and setups and utilize the OTS environment in the fashion specifically relevant to the training.16

In a recent study aimed at determining the doctrinal and contextual correctness of current PC-based infantry games, most military subject matter experts indicated that games could not provide a sufficient level of realism needed to prepare soldiers for tactics in the midst of real war. They also indicated that soldiers, if trained using games, would probably not be prepared for the mindset of war because the entertainment element in PC games is in direct contrast to the requirement for realism and survival.17

One of the common requirements for more realistic simulation training is a significant amount of simulated combat stress which can improve military performance. A common criticism of using PC-based games for military training, is the lack of situational stress and context of war. Considering the problematic context of entertainment, evidence shows that supplementing stress in PC game training may effectively produce the necessary trainee reactions. One study found that an induced threat via a “severely displeased military supervisor” during simulated combat game improved stress. In this study some individuals were stimulated by the stress and performed more effectively, while others became...
disorganized and performed poorly. A recent study in 2002 by Morris (et al) examined the effects of supplementing an infantry OTS game with realistic grotesque war scenes. This intervention produced more motivation and OTS game mission success in individuals than the unstressful control group counterpart. It is therefore proposed that contextually-enhanced material that produces positive or motivating stress, can produce higher outcome training performance from OTS games.18

The motivational quality underlying games is suggested to come from challenge, uncertainty, and complexity. While these features impose a high degree of learner control they can inhibit training and acquiring of basic skills. The motivational qualities of games have been more useful in effecting the amount of time and quality of practice.19

A recent review of military and commercial applications of simulation-based training indicated a severe lack of research data regarding training effectiveness especially on specific transfer of training.20 PC based training is often implemented without consideration of outcome performance or transfer of training.21 Armed forces must collect data during simulation training and ensure follow-up studies to determine their impact and utility as a building-block for further training.

PC games can be modified at little expense to suit the simulation needs of armed forces. This picture shows a customised version of Microsoft Flight Simulator which the US Navy uses for training pupil pilots. (Source: www.baseops.net/flightsimulators/)

HOW TO USE PC GAMES FOR MILITARY TRAINING
PC games can be used most effectively to train cognitive skills. The physical skills can obviously not be fully simulated due to the absence of a game interface that is identical to the real world. For example, if a training objective for a game is to clear a building, the trainees can learn the sequence and drills to clear a building, but they will not be able to learn how to run through passages or how, to fire shots, or how to kick down doors.

Games can therefore not replace live fire exercises and live simulations, but they can facilitate the learning of the necessary cognitive skills before entering live simulation and live firing exercises. It can therefore substitute a certain part of classroom training with more active and interactive learning.22

Training games should be considered as instructional tools and must therefore be integrated with good instructional techniques.23 This will require specialised training for instructors to facilitate PC based simulation training. The goal is not for students to play the game, but to achieve training objectives. Both immediate feedback and after-action review by instructors should promote learning. Instructor feedback is needed to ensure that important lessons learnt are highlighted to the student and to diminish the possibility of learning incorrect procedures from the game. Without instructor monitoring participants can learn the wrong lessons. The instructor should train the soldier; the PC game is one of the instructor’s tools.

Training scenarios must be realistic and instructors must be able to customize them to achieve the aim of the exercise. Game developers must constantly improve games according to the requirements of instructors and add new, relevant scenarios. The currency of PC games used for military training is therefore essential. Games older than one year usually become outdated for training unless they are upgraded.24

A military-industry team must address a number of uncertainties and limitations with PC games before they become part of service training programmes. These issues include: validation of games and scenarios; their interoperability and open architecture capabilities, as well as their ability to support a formal after action review.25

CONCLUSION
SUMMARY
The use of Kriegspiel (war gaming) in the Prussian military is an early example of using simulation for training soldiers. The US adopted war gaming from the Prussians in the 1880s and since the 1950s became a staunch supporter of war gaming. During the 1970s the use of computer-based war gaming started to receive attention for both strategic and tactical simulations. The emphasis on affordability of simulation focussed much attention on PCs and stimulated much creativity in the development of programmes for simulation. The next step in advancement was the development of a network of simulators for tanks which was made possible by microprocessors. The US military used this technology extensively in preparation for the Gulf War in 1990 for both tactical and operational level training.
In the post-Cold War era armed forces adopted business principles in their management processes which benefited the commercial gaming sectors as armed forces were compelled to consider COTS computers and software for military simulation. Commercial games with superior graphics and networking facilities were modified by armed forces to suit their own training needs. This was often done in partnership with gaming companies as part of a relationship of mutual benefit.

The current information age has changed the way that young people learn and armed forces need to exploit the affinity of the so-called wired generation for computers, games and discovery-based learning to enhance military training. With the wired generation, armed forces can use PC based simulation training extensively due to their multi-task abilities and fast context switching.

The use of PC-based simulation training has many advantages. The declining cost of computers and simulation technology make this form of training an affordable addition to live simulation or field training. Military PC games can be modified at little expense for the tailored needs of militaries and the ability to connect individual simulators, allows for units to train together.

Training with PC games offer high levels of reality and unique scenarios which cannot be exercised in field or virtual training. This enables soldiers to develop advanced problem-solving skills, as well as cognitive and motor skills. This makes PC-based simulation safer than field training, although it cannot replace field training.

PC-based simulation also has disadvantages. Computers cannot always assess the success of a student in a training scenario. Well-trained instructors are therefore always needed to guide students and provide them with feedback about their progress and mistakes. The need to make PC games entertaining can make them complicated which may require significant introductory training. Game maps can also be developed to indicate steps, game controls and other background information required to use a programme.

Despite the advanced graphics of modern PC games, they cannot provide sufficient realism and stress for training soldiers to handle complex and stressful situations as military leaders. Several techniques can be used to enhance reality, but the general lack of data on the use of PC games for simulation does not provide clarity about what works best.

Available studies about training soldiers with PC-based simulation indicate that this form of training is most effective for developing certain cognitive skills. It can furthermore replace a certain part of classroom training, but it can’t replace field training. PC-based simulation requires good instructional techniques to ensure that the instructor trains soldiers and not the PC. PC-based games should be updated regularly to ensure that games are relevant and have the required technology, but they should be validated before being used extensively.

CONCLUSIONS

Armies started to use basic forms of simulation to train soldiers in planning and executing operations, and only later for low-level TTPs. The technology for PC-based simulation developed from tactical and operational level war gaming mainly in the US. Governmental pressure for using more affordable systems in general, as well as business management principles in the post-Cold War era, pushed armed forces towards the more extensive use of PC-based simulation. The significant decline in the cost of PCs created more scope for PC-based simulation, especially to enhance individual cognitive and motor skills, as well as teamwork by means of DIS.

Even basic infantry section drills can be illustrated by using PC games, enhancing the value of more sophisticated training packages and practical field training.
EDUCATION & TRAINING

The X and wired-generations, who are today’s young soldiers, grew up with computers and PC games. Several armed forces exploit this by introducing more PC-based simulation as part of formal training with significant success, especially in aviation. This saves a lot of operating costs on expensive simulators and prime mission equipment.

RECOMMENDATION

The available case studies on PC-based simulation training indicate a few lessons learnt in terms of using it optimally and the SA Army should take note of these. Firstly, this type of simulation can be used to develop cognitive skills and thereby reduce the time spent in classrooms. Secondly, well-trained instructors must be actively involved in simulation training to familiarise, instruct and assess students on achieving training objectives. PCs alone cannot do this. Thirdly, a form of stress must be placed on students in order to enhance the reality of the exercise. Fourthly, armed forces must conduct their own studies to determine the impact, success and development of PC-based simulation training, in order to ensure its effectiveness.

APPENDIX A

TO POINT PAPER DATED 5 JUNE 08

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Introduction
Why engage in innovation and eventual military change? One popular argument is that for legitimacy purposes, national military forces have to adjust to changes in the societies they serve. Another debate turns upon the notion of waves of warfare (modes of production), generations of warfare (developments in the conduct of war over time) or epochs (changes as a result of modes of energy that drive development). Each wave, generation or epoch, so it is argued, contains innovations and pressures that diffuse to influence militaries towards undertaking change (Bunker, 1996). Legitimacy and effectiveness thus act as two predisposing agents for military change.

Professional militaries, however, are first of all foreign policy instruments of governments that have to function in an international strategic environment where self-help forms an important part of ensuring security. As such, military institutions have to remain in step with the strategic environment, and governments have the leeway, if not the responsibility, to direct their armed forces in a preferred direction. Decision-makers could opt for external balancing by acquiring allies, or internal balancing through the qualitative or quantitative enhancement of their armed forces (Isaacson, 1999:12). Irrespective of what governments choose to do, major or minor military changes are the eventual result of government choices.

Some actors often jeer at the idea of changing military futures, while others portray a good understanding of the importance of military change in the pursuit of desired military futures. Irrespective of the views held by proponents and opponents of military change, professional military institutions have to keep in step with changes in their domestic and foreign environments. Although more difficult, this change process continues during times of peace in order to fight better in future (Murray, 1996:301). The current changes within the Chinese military, those of the French, and the ongoing debate about the direction of the US armed forces, are but three contemporary...
examples of an ongoing and often painful process of military change undertaken by professional militaries.2

This essay aims to outline a number of important thoughts and findings to ponder on military change. The arguments and examples rely heavily upon academic debates and findings that cover both a retrospective, as well as a prospective view. Tempering undue expectations of military change serves as an introductory discussion, and is followed by a brief historical outline of changes in armed forces. Subsequently three more prospective aspects of military change are outlined: The process of change, some obstacles to heed, and the operation of innovation and diffusion. A number of caveats about innovations and diffusion together with a concluding summary complete the essay.

Military Change: Tempering Undue Expectations

Introducing and pushing through military change are potentially hazardous undertakings. Ill-considered military change is perhaps just as dangerous as not considering change at all, while the practice of change entails much more than acquiring military hardware. Softer and less spectacular changes in tactics and doctrine, modification of training techniques and support (Isaacson 1999:2), all collectively make for minor or major military change. Some debates and narratives on military change also often fail to move beyond arguments with a threat and political slant, and tend to disrupt the process of military change. However, the more recent body of literature on military change shows increasingly how adjustments by professional military institutions shift and refocus their roles, are multifaceted, and thus a complex undertaking.

A further matter to contemplate, points to the perception that state institutions such as military establishments are frequently viewed as enduring entities that inhibit variation and change (Clemens and Cook, 1999:442). The absence of external shocks such as war, or defections by networks and coalitions that underpin institutional coherence and durability of establishments such as a military establishment, sustain the perception of institutional adversity to change. However, monolithic state institutions can be deconstructed as systems and actors, exposing entities that are more susceptible to change - being entities that have different dynamics that either obstruct, promote or eschew change. In this regard the literature on military change (the sociology of the military in particular) tends to portray that in spite of views to the contrary, militaries do adjust and shift their ways of doing things, and quite substantially if necessary (Kummel, 2003:426).

The contemporary debate on military change is fuelled by the recent hype of a Revolution in Military Affairs (RMA), which offered an attractive, but expensive pathway towards military effectiveness (Mac, 2000:6). In effect, islands of RMA capabilities or avoiding this expensive alternative appear to be the reality for most professional military forces. Being both professional as well as efficient implies the interplay of events, controls and relationships as well as the intellectual flexibility to understand and allow appropriate change to enter and diffuse. Yet, in political circles, as well as in the military community, military change touches upon a primary policy instrument of state – one not to be found wanting when called upon and thus not carelessly subjected to the disruption of unwanted or uncontrolled change.

Several explanations outline particular motivations for military institutions to embark upon change: To emulate the success of other actors, to gain prestige, efficiency and legitimacy, and to raise one’s international status (Farrell and Terriff, 2002:266). Although the preceding motivations offer an attractive view, one important note of caution warns that successful military change is not a foregone conclusion, for once the gears of change are set in motion the outcome is not always predictable. National armed forces also respond differently to innovations and change, and some feel threatened by increased change that promotes unpredictability (Goldman and Ellason, (eds) 2003:x-xi). Undue unpredictability tends to nudge military organisations towards marginalising change and often towards a primary concern with more immediate problems (Murray and Millett, (eds) 1996:04). However, military institutions that cannot change, or that avoid adaptation to their environment, become outdated, problem militaries and a burden upon society.

The debate on transforming and adjusting military forces, or perhaps only reconsidering the ways and means to do things, received much emphasis as the international system responded to the collapse of the Cold War strategic landscape towards the end of the 20th century – and received a second shock with 9/11 attacks upon the United States. The first tended to promote the idea of a decline in the utility of armed forces, the second served to raise ideas of the importance of armed forces. Of interest is that the response of military and political elites to the end of the Cold War paradigm pointed armed forces towards a different mode of operating and so unleashed a huge parallel debate. In retrospect, however, the more contemporary debate has a well-researched and reported historic antecedent.

A Military Revolution: The Historic Antecedent

One of the most authoritative narratives on military change stems from the Military Revolution thesis of Michael Roberts and is embedded in the earlier European experiences of the 17th and 18th centuries. The impact of shifts in tactics, army size, and strategy were key developments that collectively effected deep changes that gave rise to the revolutionary connotation (Parker, 1996:2). Similar changes also diffused towards the Far East and Africa, as well as South America, where local groupings were drawn into the deluge of changes that affected thoughts, weaponry, skills and tactics of military entities (Parker 1996:174). Ultimately, however, the employment of their newly forged military institutions empowered European actors not only to fight each other more effectively, but also to build their vast colonial empires (Goldman and Andres, 1999). As a consequence, a dynamic
evolved that exposed important military innovations and fuelled their diffusion across national borders and between regions.

The Military Revolution debate is somewhat retrospective, albeit a debate which points out important trends related to how military institutions became more adept at plying their trade. Irrespective of much criticism, the Military Revolution debate presents a plausible thesis that probes and explains how deeply and profoundly military institutions are able to change over extended periods of time (Parker, 1996:4). At the heart of the debate resides the tough question of whether deep and profound military change is possible over briefer time frames. On this point, a more sobering view depicts military change in evolutionary, rather than revolutionary terms (Murray and Millett, (eds) 1996:06). However, several rival views characterise the Military Revolution debate that offer alternative perspectives on a complex phenomenon.3

Michael Roberts: Drastic shifts in tactics had a bottom-up effect that eventually even influenced political and societal matters as the effects demanded and fuelled changes at the societal level.

Geoffrey Parker: As societies developed and strived to reach out beyond their borders, several military changes and developments took place that altered the conduct of future warfare.

Jeremy Black and Clifford Rogers: Proponents of military change taking place along more evolutionary lines and being a continuous process, rather than one confined to a particular period.

John Guilmartin: The foreign focus is important, as change also has to do with demands arising from how to contend with foreign opponents, and thus how to organise and equip, train and combine your forces to be efficient against foreign enemies.

Rothenberg: Raising a professional force under the authority of and for state interests, is more important than technology-driven techniques and artefacts. Strict discipline, regulations, control and good preparation set the scene for changes through technologies and artefacts.

The Military Revolution debate comprises an historic field of study and suggests valuable narratives to consider. It is probably beyond doubt that much can be taken from this retrospective debate and in particular the extent to which change is in fact possible. Nonetheless, with regards to military change a more recent and prospective debate also developed, with a parallel strand of literature that sets forth valuable information for interested parties.

Military Change: Tracing the Process of Change

Deep military change often confronts the recognized paradigm of thought and how to do things. When rivals challenge strongly held or established ways of doing things, the idea that such beliefs and the practices they underpin are suddenly rejected and substituted is misleading. The seminal work by Kuhn (1970:84) proposes that a rivalry between an existing and a rival paradigm unfolds, from which several outcomes are possible – victory, defeat or coexistence. This view of competing paradigms holds much value for considering military change and, in particular, the perception of difficulties surrounding the shifting or ousting of established ideas and technological artefacts and systems. Some consensus exists that sudden deep and pervasive changes to armed forces and their institutions are rare. One example is the singular saliency of the nuclear revolution and the use of nuclear weapons that subsequently required the development of nuclear forces, doctrines and strategies.

In military organisations for example, the rivalry between adherents of old and new paradigms can be robust and enduring, with ongoing competition between proponents of the opposing paradigms (Kuhn, 1970:93). It is seldom found that one paradigm is quickly and completely rejected, with its adherents swarming to embrace the rival paradigm and joining its proponents. In itself, the rival paradigm often does not fully satisfy the needs and problems at hand. In reality, strands of the old or ousted paradigm linger on and often still assist in resolving emergent challenges. Part of this dilemma is visible in how modern armed forces, after the end of the Cold War, attempted to enter a new paradigm configured by ‘do good’ roles in peacekeeping and humanitarian emergencies. By contrast, this very notion still draws upon an established paradigm embedded in conventional warfare. Another example is changes to shift between Posen’s categories of offensive, defensive and deterrence doctrines (Posen, 1984:14) when the military or political status quo is altered, but not rejecting either one completely.

In the early 21st century pressures for military change remain high as articulated in the publication of Rupert Smith’s 2007 publication The Utility of Force: The Art of War in the Modern World. Smith portrays the polemics and contest between conventional warfare, revolutionary warfare and war amongst the people as a strategic reality, but a dilemma for those responsible for employing armed forces intelligently for the ends of policy. Smith covers the presumed clarity of the paradigm surrounding conventional war in contrast to the disruption caused by revolutionary warfare and the emergent uncertainty about the role and contributions and success factors for armed forces embroiled in wars amongst the people. For armed forces to migrate conceptually, organisationally and doctrinally between destructive war fighting, and more constructive ‘do good roles’ and missions, remains difficult amidst the demands of political elites clamouring for the ‘best of both worlds’.

Some agency must put in motion the process of military change and this requires decisive political leadership (Muller, 2002:161). Politicians form a primary agency responsible for placing their military institutions upon a preferred and tenable pathway of change, while military officials typically become the conduits of the institutional dynamics required to effect desired changes. Nonetheless, when decision-makers embark upon a programme of military change – irrespective of their ultimate goals – it remains important for them to understand the dynamics involved and to temper their expectations about the outcome. The envisaged changes and outcome rarely unfold and culminate in the way decision-
makers imagine it - as the Chinese found in their attempts to transform the PLA (Joffe, 2004:365.). The pathway is difficult, slow and often leads to compromised outcomes.

Military change tends to follow two broad outlines: Revolutionary or evolutionary (Murray, 1996:306). The former pattern stems from innovations imposed through top-down leadership and thus implying knowledgeable political and military entrepreneurs who are able to understand and drive the technical and conceptual scope of envisaged changes. The scope for error is however rather large for it is a closed and less consultative or inclusive pathway of change. In contrast to revolutionary innovations for change, theorists judge evolutionary innovations more prevalent (Murray, 1996:308). The evolutionary pathway comprises smaller changes over extended periods, with cumulative change the ultimate outcome. Here two perspectives are important: Firstly, innovation over time to effect change, and secondly, but more importantly, cultivating an organisational culture of tolerating ongoing innovation as an enduring feature of being an effective military organisation (Murray, 1996:310).

Major military change is less frequent, but possible (the nuclear revolution, amphibious warfare and airpower at sea for example), and entails dramatic changes in doctrine, establishing new service arms and shifting organisational goals. The final outcome, however, ultimately indicates how major or minor the changes are (Farrell and Terriff, (eds) 2001: 5-6). Examples of major military changes involve those of institutions adopting a new primary mission, being more inclined to regional than national security, and organisational restructuring to do new things. Although political decision-makers play a prominent role as the agents of change and deciding upon the preferred changes to be effected, it is the diffusion of their ideas and preferences that ultimately act as catalysts for the desired changes.

Military change originates from shifts and changes in different sectors. Farrell and Terriff, (eds) (2001:6) depict these as cultural norms, politics and strategy, and technology. Cultural norms are beliefs that regulate what is effective and appropriate - thus informing the military of who they are and what they can do. Culture and strategic culture in particular, is persistent, and changes with difficulty, but change is possible along lines of induced change, external shocks or their simultaneity. When military culture does change, it opens up the potential for wider military change (Farrell and Terriff, (eds) 2001:6-8). It is the latter change in strategic culture (shifts in preferences for using armed forces in a particular way) that reacts to the impositions of shifts in security culture (perceptions of and preferences amongst the elite of policy instruments as to which instruments are more appropriate and preferred over others).4

Attempts by norm entrepreneurs to move armed forces away from previous cultural biases are particularly powerful incentives (Avant and Lebovic, 2001:140) and perhaps illustrated by the post-1994 shifts in South Africa.5 However, Posen (1984:224) argues that military organisations are not prone to innovate and change independently. Avoiding uncertainty (self-imposed for that matter), a constrained flow of ideas through the bureaucratic labyrinth, and vested interests in established doctrine, all lean towards the creation of conditions that tend to obstruct or slow down change. In effect, this argument warns once again that military organisations do not always take kindly to innovations and change.

Strategy and politics enter as political actors push for change, or military entities perceive their voids or vulnerabilities and respond to set things right. Both pathways nonetheless meet somewhere, as military change remains dependent upon political guidance, consent and resource allocation. (Farrell and Terriff, (eds)2001:10-11). Politico-strategic circumstances thus act as drivers through political demands and perceptive military elites that grasp the need for change. When the political and military pressures for change converge, strong partnerships between political and military leaders become powerful drivers of change in military institutions. It is thus not strange that shared visions of military futures eventually give rise to strong alliances between elites to effect the appropriate changes (Millett, 1996:359). Posen (1984:241) however once again warns that civilian leadership often ignore their armed forces when tensions are low, and this ignorance tends to allow the armed forces to drift into stasis. Israel, for example suffered a dangerous decline before 1973 when it was perceived to be secure. Smith, (2007: x) points to the same trend for British forces, and the question remains whether this is the case for the SANDF?

Technology is often a catalyst for military change, but not in a deterministic way. Military conservatism places a check on technology-driven change and, in conjunction with service parochialism, hinders the proper diffusion and contribution of technology-driven change. Furthermore, the best technologies do not always enter as innovative artefacts, and neither are they always fully embraced. Rival technologies often get accepted or rejected through social networks that develop around different designs (Farrell and Terriff, (eds) 2001:14-15) where appropriateness is not the final determinant. Much of the potential of good and appropriate technologies thus drains away, or is so often just not unleashed due to a flawed process of innovation and diffusion.

The fact remains however, whether good or flawed, modern or outdated, technologies that are accepted by military establishments have to be integrated into organisations and doctrine, and eventually operated by the available human capital. A triad of systems, organisational flexibility and raising suitable human capital thus unfolds. Technology and military change reflects a complex relationship, and even though soldiers may embrace new technologies, it does not always lead to intended or desired military change (Biddle and Zirkle, 1996:199). Iraq for example, illustrates how the fascination with technology did not effect changes towards a more competent Iraqi military. Libya also acquired impressive numbers of advanced military systems, but failed to effect proper integration with existing and emergent systems and its human capital (Evans, 2001:3). Matters are thus complex and further accentuated by the following catalysts of uncertainty (Mandel 1994 58-59):

- Rapid diffusion of military technology through the international system.
- Decentralised defence decision-making.
- Dependence upon external defence arrangements.
- Resources reallocated away from military defence.
- Ambiguity about threats obstructing the construction of appropriate military defence.
- What constitutes success or victory in unconventional conflicts?

Technologies often drive change in that new technological artefacts and systems are offered to the military. The military often responds by embracing it, but have to puzzle out its integration with existing doctrine, tactics and systems. It is also possible that military actors actively seek out or demand technologies to further foster changes originating from cultural, political or strategic developments (Farrell and Terriff, (eds) 2001:13-14). Although technology remains visible in almost all the literature on military change, it is not a prerequisite for military change to unfold (Isaacson, et al 1999:8), thus showing that military change and technological innovations are not mutually dependent.

Military change also has a negative iteration that plays out in several ways. The matter of military institutions being resistant to change holds an element of truth; for they do foster and harbour service and strategic cultures that either mould or block changes. Service cultures protecting their own, bureaucratic cultures entrenched in a particular way of operating, and upsetting established careers, function as inhibiting factors. Military leaders also prefer to maintain certainty in their dangerous environment, and pressures for constant and deep change upset this quest for certainty and predictability (Murray, 1996:301-302). Changes cannot merely be forced on a military institution, for the proper diffusion of changes determines if it is able to take effect and be beneficial. This goes for technologies as well, where brilliant technologies often fail prey to uninterested military establishments.

Successful military change, however, presumes that certain changes must be made and this is often not the case. Even the US military - in spite of its embracement of the RMA concept - finds it difficult to structure how its forces should fight in future, and falls prey to inservice. Service parochialism, for example opposes inter-service cooperation. Technological parochialism disrupts general cooperation to effect a system-of-systems outcome. Joint doctrine remains underdeveloped and cooperation between the military and civilian officials to shape military change does not always go well (Farrell and Terriff, (eds) 2001:15).

Furthermore, not all countries (perhaps most) are able to introduce and push through major military change (Isaacson et al, 1999:7). Innovations and their diffusion are also vulnerable societally. Cohesive societies are more prone to allow, fund and embrace innovations regarding their military forces and divided societies less so, as more attention, resources and energy are turned towards ensuring the status quo of stability and security within (Isaacson et al, 1999:14-15). Societal tensions and divisions eventually find their way into the military with detrimental consequences for the operation of innovation and diffusion as catalysts for successful and meaningful change. Political preferences and military needs often do not fit together comfortably, which can sustain unproductive rivalries amongst political and military elites.

Failure to innovate and change can be disastrous, and in particular when called upon to go to war. Historically this is visible in the WW2 French defeat by the innovative German military. Learning from the past is a rich experience, but so often ignored. To learn even from your enemies or those you dislike should not simply be eschewed. Doctrinal rigidity also serves as a barrier, and often to the point of defeat before room for innovations is allowed. The 1973 Israeli surprise by the Arab forces is a case in point (Isaacson 31), as the Israeli forces thought they “knew it all” and could counter anything the Arab armies came up with. Although the list of barriers is extensive, Murray (1996:325) argues that the answer remains that of cultivating an educated officer corps and one encouraged to innovate. One of the best examples of such an approach is that of von Seeckt and the German officer corps after WW1. Von Seeckt cultivated a German officer corps prone to understand the importance of ongoing innovation and change in order to fight better in future (Watts and Murray, 1998:411). The latter is perhaps more representative of the professional view of militaries as learning organisations, with members understanding the importance of innovation in order to provide the national defence they are held responsible for (Isaacson et al, 1999:18).

Blunt resistance to change has negative consequences of its own. The post-Cold War Russian case shows failed change in spite of exposure to external shocks and the unravelling of traditional politico-military networks. For the Russian military a lack of proper political guidance on change stems from a political leadership that failed to grasp the dilemma of their armed forces (Mathers, 2001:161). Changes tend to follow a negative pathway and illustrate weak political guidance and military stasis – a matter visible in the Russian failure in Chechnya. Furthermore, absolute political subservience stifles change, for if the political leadership does not induce change, stagnation and stasis sets in. The idea of some military creativity to foster change thus remains absent. Without political cues the status quo (even if dangerous and threatening) is maintained (Mathers, 2001:180).

In spite of difficulties, military change does progress through hard and soft technologies, vast expenditures on military research, and more sophisticated ways of how military institutions assess their performance and systems (Murray and Millett, (eds) 1996:1). One explanatory framework to view in more detail how military change unfolds is that of innovation and diffusion.

**Innovation and Diffusion: Pathways of Military Change**

Military change ultimately stems from the operation and effectiveness of innovation and its diffusion through the military realm. Innovation during peace and war refer to behavioural changes of individuals and organisations; for technologies innovation involves new technologies and building new machines. Although military establishments do not automatically embrace innovations, certain pressures are at work. Pressures and encouragement for innovation include failure to achieve a set purpose, external pressure...
to comply, and endeavours to expand (Posen, 1984:47). Innovation thus offers opportunities to overcome uncertainty, to keep in step with change, cope with unpredictability from changing allies and enemies, and to harness new capabilities and technologies on offer (Posen, 1984:29-30). Innovation also staves off stagnation while simultaneously allowing alignment with political goals.

One important distinction is that innovations that drive military change during times of war and during inter-war periods have different dynamics. Military changes during times of war display shorter time frames with a lesser constraint on resources. During inter-war periods time frames are longer, the need for the military is often questioned and resources more constrained and thus more uncertain or unpredictable. These difficulties typically play out through the inherent differences between politicians and soldiers. Soldiers and politicians have little empathy for each other’s roles – a trait enhanced by a politico-military culture clash, ignorance, distinctive responsibilities (political generalists and military meticulousness), and often not successfully or accurately merging political goals and military strategy (Gray, 2000:58-63).

Military change, however, requires the inculcation of a culture of innovation over time (Murray, 1996:310). This tends to become a trade-off between allowing longer periods for change and the role of strong individuals in the top-down mode to take charge and push through desired innovations. In both cases the inherent uncertainty brings about difficulties that hinder military changes designed to fight future wars more efficiently and effectively – the latter being fraught with uncertainty. In part, the uncertainty is ameliorated by certain actions such as building visions of future warfare and pursuing bureaucratic acceptance of desired changes. A further institutional process to systematically lower uncertainty is to explore, test and refine conceptions of future war (Watts and Murray, 1996:403-410). Wars of destiny and wars of efficiency form two important future considerations for they present decision-makers with a stark reality for deep military change: Wars of efficiency strive to fight selected wars efficiently with existing systems and organisations with the hope of prevailing; wars of destiny strive to bring dramatic new systems to the battlefield in order to change the way in which wars are fought (Bunker, 2003: 165-166; 167 and 170).

Diffusion of innovation is a necessary precondition for military change. Dumping new untried ideas and artefacts upon the military is a dangerous practice, and in particular if its diffusion becomes problematic. Although innovation could benefit military organisations the receptiveness of military practitioners to innovations – whether hard or soft – remains crucial (Goldman and Ross, 2003:387). Diffusion is an important dynamic, and entails how weapons, technology, know-how and methods of carrying out military operations are distributed, assimilated and exploited. Whilst a popular image remains of innovations spreading and being assimilated with difficulty within military organisations, an understanding of the alternative pathways how diffusion takes place is perhaps more appropriate. Innovations that stem from ‘a better way’ to do things cannot merely be assumed to filter through organisations like armed forces. Even if the innovative ideas or artefacts are ‘best practice’, it remains important to understand their diffusion to eventually effect the desired new way of doing things. Several factors regulate how innovations resonate with the client and are rejected or accepted and thus diffused:

- **Complexity**: Difficulty of understanding and using the innovation.
- **Trialability**: Possibility to experiment with the idea or artefact.
- **Observability**: Visibility of the results or benefits of the innovation to others.
- **Compatibility**: Degree of consistency with existing practice and culture.

(Goldman and Andres 1999:6-7))

Diffusion as the transmission of new information also requires that senior decision makers or certain elites decide to embrace new technologies, ideas and practices, and their adoption by the military establishment. The adoption (that is traditionally viewed as difficult, slow, or painful and not always successful) is explained along different lines. Several predisposing or obstructive factors play a role in promoting or disrupting innovations to enter and diffuse through the military realm – amongst others, the following suffice:

- Different external security requirements serve to speed-up or slow down the adoption of new innovations.
- Domestic support for or opposition to new ideas operate through organisations, social networks, and domestic pressure groups also enhance diffusion.
- Cultural differences serve to point out when a cultural mismatch exists between international and domestic norms.

(Goldman, 2006:69)

While external threats explain something about the stimulus for innovation and diffusion, domestic politics and cultural arguments explain the variations that take place – why it is not a simple one-way process to effect military change. It remains, however, an elite decision to consolidate the status quo, or opt for reform and change. Incumbent gatekeepers, whether collective entities or individuals, play an influential role as to which changes and how much change they will tolerate. If the elites decide to maintain the status quo, change through innovation becomes difficult and often has to contend with the existing or incoming political culture: Values governing authority, status, promotion and recruitment, citizenship and allegiance. If a traditional political or military orthodoxy is institutionally protected, difficulties also arise for the diffusion of innovations; if the official orthodoxy is rejected, more room appears for the diffusion of innovations (Goldman, 2006: 70).

A cultural match between international norms and domestic norms – whether existing or newly embraced - is important (Goldman, 2006:74). The rise of International Law and South Africa’s acknowledgement of the importance of International Law through its constitution coincide, and little controversy surrounds its inculcation and embracement by politicians and soldiers. The norms of International Law seemingly diffused
sufficiently through the SANDF. Nonetheless, a match or clash either promotes or inhibits diffusion, but tolerance of cultural diversity is perhaps more explanatory. If elites prefer and enforce a particular strand of culture, innovation is suppressed, if more tolerable towards diversity, innovation is enhanced. The conventional and revolutionary mindsets of forces at the initial integration of South African armed contingents perhaps best illustrate this point. Whether having shifted, or gained the upper hand, more agreement and cooperation over time seem to have unfolded.

Domestic political structures also influence the space for innovation and diffusion. Centralised, state-dominated structures allow few entry points for innovative ideas, but can force through selected diffusion of the changes they prefer. A less centralised state make-up promotes the entry of innovations, but diffusion is more difficult to speed up by a top-down approach (Goldman, 2006:73). The latter also allows more room for influence by actors from outside, but less control over diffusion of the innovations. In this way political culture and political gatekeepers thus play a determining role with regards to the conceptual and institutional space for innovation and diffusion.

Diffusion primarily takes place through external inducement, emulation and social learning. External inducement can be subtle or overt, and often originates from civilian leadership intent upon correcting major voids (Eliason and Goldman, 2003:15). Emulation takes place when actors monitor success and import or embrace the innovation. When such innovations appear to benefit other actors with similar social-cultural settings, it facilitates the emulation. Social learning and diffusion meet when difficulties arise and parties attempt to resolve an impending crisis by seeking out new information to resolve the dissonance (Eliason and Goldman, 2003:16). Innovations - whether hard or soft - often have to undergo some trials, experimentation, or reconsideration as a result of diffusion difficulties.

Diffusion is not a linear process, and thus also raises a host of questions and some uncertainties - both for understanding it, as well as explaining what happens. For innovations to effect or precipitate the preferred changes, several factors are at play: (1) the rate of military diffusion (e.g., uniform or uneven), (2) rates of adoption (e.g., rapid or delayed), (3) national response to successful military practices abroad (e.g., emulation, reinvention, no response), and (4) shifts in state influence (advantageous or disadvantaged particular subsets of states) (Goldman and Andres, 1999). Perceptions of the utility and disruption inherent to innovations (ideas and artefacts) thus act as conceptual filters for how innovations diffuse through an organisation.

The final hurdle that remains is whether states can use innovations, even if they diffuse sufficiently through the organisation (Eliason and Goldman, 2003:14). States thus finally have to incorporate innovations through imitation of the entire innovation, adaptation, or selective emulation of part of the innovation. (Goldman and Ross, 2003:387). Full imitation is not frequent while selective adaptation and emulation are more frequent, but different assumptions govern how one can understand these outlooks (See Table 1).

Culture remains an important and pervasive influence – a matter accentuated by Gray in his view that “No one and no institution can operate beyond culture.” (Gray, 2000:129). Diffusion, therefore, does not function in a cultural vacuum, and is slowed down if socio-cultural changes first have to take place. Political culture, strategic culture, security culture and service cultures of air, maritime and land forces all play a role as innovations diffuse through the military hierarchy. However, compatible cultural values, practices and past experiences speed up diffusion (Eliason and Goldman, 2003:9) as they ameliorate the controversy stemming from opposing and competitive views. Cultures (whether national or regional) form part of the filtering process during diffusion that mould and reform an innovation and the eventual changes that it effects.

Military decision-makers and their political leaders must at all times realise that culture operates as a filter to allow some innovations to diffuse through imitation, adaptation or selective emulation, and shut out other innovations. Although technologies, for example, are viewed as neutral and should diffuse easily, the cultures of the recipient and the originator tend to play a role. As for soft technologies such as organisation, doctrine, and policy matters, cultural filters perhaps operate more selectively regarding ideas and structural matters (Goldman and Ross, 2003:385-386; 391-392).

Goldman and Ross (2003:396-397) warn that although innovation and diffusion are important explanatory agents that underpin change, one has to consider the lessons they hold for defence decision-makers. These lessons have some contemporary value of which a number are briefly outlined below and linked to recent examples.

**Some Important Lessons to Ponder**

Those leading the way to introduce innovations and drive their diffusion do not hold a monopoly for long and the ‘advantages’ soon diffuse to other actors – whether friends or foes. At present the Chinese emulation of Western systems demonstrates this difficulty, and in a way corresponds with Mandel’s (1994) views above of uncontrolled diffusion making the world more dangerous. Other actors tend to build upon and even improve on

<table>
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<tr>
<th>Theory</th>
<th>State reaction to innovation</th>
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<tr>
<td>Neorealist¹</td>
<td>Reactive &amp; emulation</td>
<td>Uniform diffusion</td>
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<tr>
<td>Power transition theory²</td>
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<td>Offence-defence theory³</td>
<td>Less responsiveness</td>
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<tr>
<td>Organisation diffusion theory⁴</td>
<td>Differential state response</td>
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(Goldman and Andres, 1999)
innovative changes pursued by a fellow actor. The Russians, for example, initiated the RMA idea, but the Americans refined it towards innovative thought and artefacts for diffusion in the American armed forces. It is no secret that US forces now contain more islands or higher levels of RMA-styled innovations than any other country.

Military change that stems from good innovation and its proper diffusion does not guarantee victory. In a way, but not in a perfect sense, the US forces found this in Iraq after the 2003 invasion and before them, the Russians in Chechnya, albeit in the sense of innovation and diffusion being rather poorly managed. More historically post WW1 Germany demonstrates proper diffusion of hard and soft innovations, but they still lost in WW2.

The foundations of the ideas and artefacts that act as catalysts and elements of military change, often have their origins outside the military. Both soft as well as hard technologies are relevant. One extreme case is perhaps the EU influence upon military affairs (Treacher, 2004:50). Off-the-shelf technologies serve to further illustrate this point. The fact remains that militaries no longer serve as primary hubs for innovations that drive military change - the private sector became just too competitive.

Effecting comprehensive and deep military change is often unnecessary or even an illusion and just not tenable. Sweeping military change is costly and often disruptive. This matter unleashed a huge debate and in particular against the diffusion of the RMA debate. As for the latter, the verdict is out that ideas about deep change rarely produce the very change envisaged. The US found this with the RMA, as did countries in Europe. The price and impact of deep changes based primarily upon high technologies became the focus of individuals and institutions challenging expensive RMA-styled military changes (Cordesman and Frederickson, 2006; Kaplan, 2006).

Soft innovations do not diffuse as easily as the more tangible and visible hardware. While military hardware diffuses quite rapidly to other actors, matters of doctrine and organisation, for example take longer to diffuse, if at all. Changes in culture, policies and doctrines are stickier and more difficult to effect through ideas, and their perceived diffusion and the extent to which culture enters change, slows down (Gray, 2000:131). Although states may declare their preferences for innovations, it is the realities of societal, bureaucratic, organizational and even individual influences and preferences that shape or exclude or temper the changes that leave their imprint.

Concluding Remarks

This paper briefly outlined selected elements of military change. The importance of military change is primarily driven by the notion that armed forces are key institutions in the state policy realm, and their role to defend national interests requires of them to be suitably prepared for this role. Keeping in step with a changing threat environment and with the societies they serve, require of military forces to undertake minor or deep changes in order to build and maintain legitimacy and effectiveness. This is an ongoing process during times of peace as well as during times of war, and more prone to be evolutionary than revolutionary in kind.

Although some view military institutions as generally opposed to change, this perception is not a general explanation of how military change unfolds. Some factors do inhibit change, others facilitate change, but changes in military forces take place amidst factors that regulate the extent of change. Envisaged military change and the final outcome over time tend to differ. The outcome is the product of competing factors that promote, obstruct or redirect the envisaged changes. The inherent dynamic of state entities, a hierarchy of cultural influences, and politico-military polemics all play a role to prevent, ameliorate or accelerate military change.

Innovation and diffusion are important conduits of military change through hard and soft technologies. Both are acutely exposed to the very factors that promote or inhibit military change. It is however most important to understand that innovation and diffusion operate in the realm of conditions that promote or obstruct their roles. On the one hand diffusion of innovations is exposed to their physical attractiveness, visibility of their utility as well as perceptions of being better than existing ideas or artefacts. On the other hand, the choice to embrace innovations still has to contend with the more obscure institutional, bureaucratic and personal predispositions that operate in a faceless manner in military institutions and defence structures the impact of which is often beyond control.

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**FOOTNOTES**

2. South Africa embarked on deep military changes in its armed forces since 1994. Britain, France and Germany simultaneously grappled with bringing their armed forces into step with a new and rising post Cold War paradigm for preparing and employing national armed forces (Connetta et al 1996 ; Unterseher 1999).
6. Competitive logic used to project an even pattern of diffusion for states copy best military practice from most successful actors.
7. When shifts in development takes shape through shifts in modes of production the critical pools of available resources grow. More resources become available that allows governments to allocate more to defence.
8. A predilection for offensive or defensive strategies of states shape the selection of innovations and in turn mould innovations through “demand”.
9. Technical efficiency is only one variable relative advantage (the degree to which an innovation is perceived as better than the idea it supersedes), complexity (the degree to which an innovation is perceived as difficult to understand and use), trialability (the degree to which an innovation may be experimented with on a limited basis), and observability (the degree to which the results of an innovation are observable to others), the degree to which the innovation is perceived as being consistent with the existing values, past experiences, and needs. (Goldman and Andres)
BOOK REVIEWS

TANK MEN

Tank Men
Author - Robert Kershaw

Much has been written about armoured warfare, and particularly armoured warfare in the Second World War. Robert Kershaw approaches the topic from a different angle to most. Tank Men studies precisely that, the men who crewed the tanks of both sides of that war. Himself a serving British Army officer with operational service under his belt, albeit as a paratrooper rather than in armour, he addresses the topic as someone who has himself experienced the stresses of operations.

Kershaw sets the scene with the first tank operations in WW I and a discussion of the development of tanks and armour doctrines between the wars. That discussion looks at how the British Army squandered its technical lead, how the French Army went up the technical blind alley of overloading its tank crews - the one-man turret of the Char B1 being the prime example, and how Russia built up its immense tank force and then lost the plot. He also describes the impact of tank operations in the Spanish Civil War and how the Germans and Russians drew diametrically opposed lessons from their respective experiences, the Germans drawing the correct one.

The bulk of the book then looks at the experience of tank crews during the key stages of WW II – the Polish campaign, the fall of France, the war in North Africa, the war in Russia, the fighting in the bocage of Normandy, and the final stages. Each period is discussed in terms of the doctrinal and technical developments and how they impacted on the tank crews of the opposing forces.

The later sections of the book are particularly interesting when Kershaw compares the actual experience of American, British and German tank crews with the results of a neurological study conducted just after the war (Swank and Marchand) to develop a combat efficiency model. One aspect that stands out here, is the impact of exhaustion and how even quite short rest periods can allow soldiers to recover their effectiveness. Anyone who has served knows this – but how many of us act on that knowledge?

Another point that comes out very clearly, despite not falling into the actual theme of the book, is the failure of most governments to provide adequately for defence in time of peace. With the exception of Russia and perhaps the partial exception of France, no country was ready for its role in WW II. None had adequately equipped their forces – not even Hitler, who went to war long before the Wehrmacht was in any real position to fight a major war. The Panzertruppe, in fact, only really began to receive effective tanks in the course of 1942.

An easy read and a worthwhile read for anyone who has to command or train soldiers, or has to develop doctrines and organisational structures for combat forces. There are a lot of lessons here that one can avoid having to relearn.
Sniper One
Author - Sergeant Dan Mills

Do not expect an academic or historical treatise. This is a book written by a soldier for other soldiers, and it reads to some extent like a thriller. But there are valuable lessons to be learned, not least regarding the ‘force multiplier’ effect of experienced NCOs, a factor that the SA Army has never fully grasped. A particular aspect is that these are extremely proficient soldiers who do not aspire to promotion to high ranks; they want to be competent soldiers while they serve in the Army, and then move on to another career after they finish a short or medium-service tour. We would do well to provide a proper career path for such soldiers – they will often be the ones who make a unit.

A second lesson lies in the very considerable value of the scout/sniper section of the infantry battalion, an element that the South African Army dropped for some obscure reason and has yet to reinstate. The siege of ‘Cimic House’ in Al Amarah might have been an extreme case in a post-war stabilisation situation, but troops engaged in other ‘operations other than war’ will find themselves in less extreme but similar situations. The capabilities of a properly trained and equipped scout/sniper element could be the difference between success and failure, and will certainly keep casualties down.

Finally, there are important lessons to be learned from the wider situation faced by the 1st Battalion, The Princess of Wales’ Royal Regiment – some of the ‘that is how to do it’ kind, and others of the ‘how not to do it’ kind. The SA Army may not be involved in Iraq or Afghanistan, but it will continue to be involved in peacekeeping operations, and such operations can very suddenly slide into peace enforcement or something that is perilously close to war. Then we could find South African troops in a very similar situation to that faced by Sergeant Mills and his comrades.
Reasoning officers of the SA Army?

Major Peter Gray

INTRODUCTION
In 1993 a book titled “War and Anti-war” was published in the United States. The authors Alvin Toffler and his wife Heidi, basically documented the process followed in the United States after the end of the Vietnam War in 1975, and the activities which then took place to ensure that the United States Army was prepared for what they termed “Third Wave War”.

STRATEGY OR POLITICS?
Throughout the book the claim is made that a lot of study and research was carried out to ensure that what was planned was not only feasible, but was also in line with what the politicians required. This was done by way of meetings, briefings and workshops between the soldiers and the politicians.

A number of recent events however, including the events of the 11th of September 2001 and the developments in the Iraq War show that either the plan was not correctly orientated, only certain parts of the plan were effectively developed, or that the politicians did not in fact actually buy into the plan. This however, is outside the scope of this essay. The question the author wishes to ask here, is whether the development of a “thinking officer” at all levels, would not have given rise to less of a problem.

CURRENT SA ARMY “THINKING SOLDIERS”
The post-1994 SA Army was an amalgamation of seven different forces, but the previous South African Defence Force doctrine was accepted by all concerned, as the intended (and fundamental) doctrine of the post-1994 South African National Defence Force. After an initial phase where “100 years of peace” were foreseen, the SANDF has subsequently found itself embroiled in a wide variety of different operations and activities, all over a very wide front. In other words, there is a definite threat of a situation similar to that of the Americans developing, where a situation, activity or battle will arise, for which no training has been done, no formal doctrine has been provided, and for which the soldiers have not been directly prepared. Would a “thinking soldier” not be the best weapon here?

It is open to question whether the current training of SA Army officers lends itself to the development of “thinking officers”, and whether simply ensuring this skill is developed (because history teaches us that this is indeed a skill), will ensure that in future SA Army officers will not be better developed to deal with all situations. It would appear that international events currently, and the speed with which the battlefield can and does change, does not require a much more committed, but also a much better developed and reasoning officer.

THE NEED FOR A SOUTH AFRICAN “THINKING OFFICER”
The logical question which now arises is “how is a “thinking officer” developed?” Obviously the alternatives are as varied as there are training courses, but what is increasingly required, is that it be done urgently, thoroughly and completely, soon.

There are probably as many solutions as there are people and training institutions. As the South African military we possibly suffer as much as the Americans, from the “civilian is always better” syndrome. This is not always true. In a single sentence, the most likely-to-succeed route, is for all of the (Junior) Officer training institutions in the military to gather somewhere, and to table all of the previous attempts, the successes which have been achieved, and to combine these into a workable solution. Most of the arms of service, and the corps within the Army (specifically) tend to operate in the form of silos – where each organisation attempts to operate, develop and improve within its own environment, regardless of the experience which someone else, who has operated in the same environment, has achieved. In sharing this knowledge and experience, we are providing our officers with added value, which will allow them to operate in any environment, under any circumstances.

The crux of the solution is that this sort of characteristic is established in junior officers, and only built upon in later courses, for more senior officers. It is this principle which must be initiated first – to obtain and/or structure this training, to implement it, develop it and improve upon it, and then to sit back and watch the results.

CONCLUSION
The day of strictly “do as you are told” soldiering is past. There is certainly still room for autocracy, but when the officer and his/her soldiers are alone, what happens? Is the officer in a difficult situation able to reason for himself/herself what options are open, and which will be the best? And then to see this solution through, with all of the necessary options, changes and adjustments?

Remember that peoples’ lives may very well depend on the best solution being taken, and the speedy change of a situation must never either complicate or convolute the situation to the extent where the officer is not able to deal with the problem at hand. It is in this speedy resolution of the situation, that the problem will be resolved and the situation saved, but also the lives of his or her subordinates saved.