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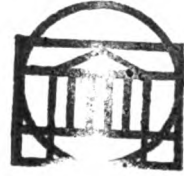
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A TEMPLATE FOR MIDDLE POWERS?**

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South Africa's Defence Industry: A Template for Middle Powers? ¹

Greg Mills and Martin Edmonds

Introduction

The South African arms industry employs today around half of its peak of 120,000 in the 1980s. A number of major South African defence producers have been bought out by Western-based companies, while a pending privatisation process could see the sale of the 'Big Five'² of the South African industry. This much might be expected of a sector that has its contemporary origins in the apartheid period of enforced isolation and self-sufficiency.

But the South African defence industry may well illustrate the way forward for middle-ranking powers in terms of reorganisation and the effective use of defence purchases to tie in with global players and the global market. This paper thus looks at five areas:

1. It provides a brief historical overview of the South African defence industry until the present.
2. It examines current developments and trends, especially the impact of the defence reorganisation and the recent R25 billion's worth of defence purchases by the South African government on the industry.
3. It examines possible future purchases and the impact this might have.
4. It identifies global trends in defence equipment, the international arms market and prognoses of future types of conflict and wars.
5. It highlights future challenges for South Africa in the context of this changing global environment.

The Historical Legacy

The South African defence industry can trace its industrial roots back to the production of light weapons, armoured cars, artillery pieces and aircraft during the Second World War. In the early 1960s, the need for an indigenous defence industrial capability received a boost through five inter-related events: 1) the 1963 voluntary UN arms embargo against the apartheid regime; 2) the refusal of traditional supplier Britain under the Wilson government to supply weapons in the 1960s and the consequent abrogation of the Simonstown naval agreement in 1975; 3) the South African Defence Force's (SADF)

1. This paper was presented at the conference staged by the National Intelligence Council (NIC) and the International Institute for Strategic Studies (IISS) on 4-5 November 2000 on the topic 'Transformation in Global Defence Markets and Industries'.

intervention in Angola in 1975, which showed up glaring deficiencies in the South African arsenal, particularly of suitable trucks and long-range artillery; 4) the imposition of the mandatory 1977 UN arms embargo; and 5) the collapse of the white-rule colonies (and their transition to black majority rule) of Mozambique, Angola and Rhodesia respectively in 1974, 1975 and 1980.

In responding to these changes in the external milieu, in the 1960s, the South African armed forces were politically insignificant. In the 1980s they became the dominant participants in domestic and foreign policy-making at the highest levels of state. Evidence of increased militarisation was reflected in the size, structure and sophistication of the SADF, which depended, in turn, on national threat perceptions and the health of the economy. The growth of defence expenditure, as a proportion of the budget and GNP, as well as in absolute terms, provides one of the clearest indicators.

Table 1: SA Defence Expenditure³

Year	Nominal spending (Rm)	Real spending (Rbn at 1995 values)	% of GDP	% of govt spending
1970/1	252	5,441	2.17	9.67
1972/3	327	6,251	2.25	8.30
1974/5	699	10,867	3.12	12.72
1976/7	1,374	17,043	4.86	16.69
1978/9	1,553	15,610	4.37	15.60
1980/1	2,341	18,320	4.15	17.22
1982/3	3,196	18,916	4.33	16.66
1984/5	3,957	18,680	4.03	14.59
1986/7	5,521	18,878	4.23	13.72
1988/9	9,939	25,926	5.51	17.77
1990/1	10,165	20,226	4.11	13.74
1992/3	9,828	14,882	2.88	9.44
1994/5	10,146	19,081	2.35	7.51
1996/7	10,246	11,124	1.92	5.90
1998/9	10,538	9,861	1.79	5.27

Before 1960, the SADF accounted for less than 7 per cent of annual government spending and under 1 per cent of GNP. In response to changes in the perceived security threat discussed earlier, by the 1978/79 fiscal year defence appropriations (R1.55 billion) were around five times the 1972/73 level, roughly a threefold increase in real terms, accounting for 16 per cent

of the budget and about 4.4 per cent of GNP. These allocations ballooned to R2.3 billion in 1980/81, R3 billion in 1983/84, R4 billion in 1985/86, R5.5 billion in 1986/87, and R6.6 billion in 1987/88. This leapt to R9.94 billion in 1988/89.

The rapid rise of a military-industrial complex provides a tangible index of the process. International isolation and the UN arms embargo stimulated a symbiotic relationship between private industry and finance on the one hand and the state security sector on the other. At the hub of this complex rested the Armaments Corporation of South Africa Limited (Armcor), the controlling body of weapons research and development and manufacture.⁴ Responsible at its peak for the direct jobs of about 25,000 personnel and the indirect employment of 130,000 more, Armcor controlled ten affiliated nationalised industrial subsidiaries and distributed work to some 1,000 sub-contractors in the private sector. From 1977, self-sufficiency became a top priority for Pretoria's strategic planners.

This military-capital nexus became capable of producing a wide range of basic and sophisticated weaponry. For example, in 1966 the first Impala Mk1 (Aermacchi) was produced (150 aircraft followed). In 1967 the Atlas Aircraft Corporation was opened, and in 1975 the Mirage F1, Mirage 111 and Alouette 111 assembly process was initiated. In 1974, the first Kudu CM4 light-transport and Impala Mk11 were built (99 followed). Three years later, in 1977, the Puma SA330 program was launched. The Cheetah fighter upgrade program, started in 1984, saw the rolling out of the Cheetah D2 in 1986 and the Cheetah E a year later. With helicopters, local production of the Topaz engine started in 1985, while the development of the Alpha XH1 helicopter demonstrator was followed by the launch of the Oryx Puma upgrade in 1988 and the Rooivalk CSH2-XPM attack helicopter in 1990. In other areas, South African industry developed sophisticated artillery systems (G-5 and G-6), anti-tank and air-to-air missiles, radio and night vision sets, APCs and mine-protected vehicles such as the Ratel, Casspir, Buffel and Mamba, the Rooikat wheeled armoured car, and an upgrade for the Centurion MBT known as the Olifant. It also constructed Reshef-class strikecraft and logistics supply ships, and maintained locally the three Daphne class submarines.

Although some gaps remained in the SADF arsenal, South Africa became virtually self-sufficient in modern weapons systems. And because creation of an arms-manufacturing capability solely for its own needs would not have been economically feasible, South Africa also became a major exporter. In addition, South Africa developed the capability to produce nuclear warheads.⁵ In short, Pretoria's impressive technological and logistical

achievement in anticipating, and largely overcoming, the arms embargo furnished the regime with an essential tool when confronting its enemies in its hostile regional environment.

Other measures taken to bolster the SADF included the rapid expansion of conscripted white manpower. The National Service requirement for white men, for example, was increased from 12 months to two years in the early 1970s. Efforts were launched to enlarge the Permanent Force (PF) element of the armed services, as well as various schemes to attract white females into uniform. Both politically and militarily, however, the most significant element in the expansion of the SADF was the enlistment of black, Indian and coloured South Africans into combat roles. By 1990 an estimated 40 per cent of the PF were 'non-white'. The security forces of the homelands were also strengthened.

The Status Quo

With the change in South Africa's strategic political circumstances both externally and domestically after 1990, and especially following the advent of the first non-racial democratic government in 1994, the fortunes of the defence establishment altered dramatically. As the table above indicates, defence spending dropped substantially, by more than 50 per cent in real terms between 1990 and 1999. The defence force downsized to accommodate these changes. The defence industry had also to downsize, while attempting at the same time to make up for a loss in domestic income through exports.

Industrial Reorganisation

Following the end of the Namibia/Angola 'border war' in 1990, the release of Nelson Mandela from prison and the unbanning of the African National Congress (ANC) and other political parties the same year, in 1991 Armscor was divided between the armaments procurement division (Armscor) and the production side (Denel). Today, major changes are afoot as international companies buy into the local firms (partly through the defence package deals) and the South African state-privatisation process begins to take shape.⁶

As of August 2000, the companies that have been bought out by international firms comprise: Olifant Manufacturing Company (OMC) by Vickers; Paradigm Systems Technology partly by Bae Systems; African Defence Systems (ADS) by Thomson SA; Advanced Technologies and Engineering (ATE) partly by Bae Systems; Grintek Avitronics partly by Celsius Technology of Sweden; and the European Aeronautic Defence and Space Company (EADS)

has a share in Reutech Radar Systems. The privatisation of Denel, which accounts for roughly half of defence production in South Africa, was announced in August 2000.⁷ Currently (as of the time of writing in September 2000), Bae Systems and EADS are tipped to take a 20 per cent stake each in Denel Aerospace.

These developments are also linked in with so-called 'black empowerment' defence restructuring and arms package deals, which have come under some public scrutiny and criticism. A number of black empowerment companies have acquired contracts from the defence packages, but questions have been raised about nepotism, and scepticism that these groupings represent genuine black empowerment interests.⁸

The Defence Packages

Following a wide, publicly consultative Defence Review process undertaken from 1996 onwards, a decision was taken in 1999 to re-equip the SANDF with modern, largely imported matériel. This decision process was made in two stages: first, the issuing of Request for Information (RFI); and then a shortlist of potential suppliers who were then issued with Request for Proposals (RFP) based on three separate criteria: the technical/military specifications and functional abilities; counter-trade⁹ aspects (the minimum expected was 100 per cent); and, the financing arrangements. Ultimately, the South African decision was:

Table 2: SA Defence Packages, September 1999¹⁰

Item	Original Tender	Cabinet Decision	Replacing
Submarines	4	3 (German Consortium)	Daphnes
Corvettes	4	4 (German Consortium)	—
Light Fighters	38	9, options on 19 more (SAAB/Bae, Gripen)	Cheetahs
Jet Trainers	24	12, plus options on 12 more (Bae, Hawk)	Impalas
Light Utility Helicopters	60	30 (Augusta A-109)	Alouettes
Main Battle Tanks	95	0	Olifants
Maritime Helicopters	5/6	0	Decision delayed

There are two main reasons behind the selection of certain types of military equipment by South Africa in 1998/99:

1. Pretoria's main focus was to win foreign investment for South Africa through counter-trade, not to re-equip the SANDF.

2. There was a strong imperative to ensure that the defence deals went to South Africa's major European trading partners – Germany, Britain, France and Italy. That was partly to cement country-to-country links and partly to show the US that South Africa did not need Washington. Russia, for example, had no role to play in either scenario. As it turned out, France did not get the intended major package (the tanks), but has since won the combat management system for the patrol corvettes and is likely to be given another major project in due course. In the opinion of some, the Swedes got into the act by luck: the Gripen was the only new-technology fighter that was affordable and it had the link with British Aerospace. Spain lost out on this round, but may win the order for new transport aircraft.¹¹

In this regard, Pretoria wanted to position South Africa within what it perceives as the unfolding nature of a global defence industry divided into two emerging super-blocs - the Europeans and the United States. South Africa, they have argued, has more to gain by being a partial-systems supplier to the Europeans than a complete-systems manufacturer to niche market areas.

The Impact of the Counter-trade/Offset Deals

The nature of the DIP and NIP agreements is expected to increase the global share of the South African arms industry and provide a significant boost to production. The counter-trade programs required a certain portion of the defence contracts to be fulfilled by local industry. As noted, the government's policy required a 100 per cent counter-trade requirement, half of which had to be spent on military or like-technology projects. This will all, given the time-frames involved in the weapons' procurement, have to be absorbed by local industry within the next seven years. As the CEO of Denel has noted, this provides a "rare window of opportunity for our industry to grow new business competencies and revitalise itself into a new role".¹²

For example, in the aviation sector, the Augusta A-109 deal allows for Denel Aviation to build rotor blades, tail and fuselage assemblies and parts for the Turbomeca Arrius engines for the A109s, and will have rights for supplying the A109 and A119 to the African market. The avionics suite will also be integrated in South Africa. The contract for the Bae Hawk LIFT includes the construction of sub-assemblies for the type, such as ailerons and stabilisers. This deal will also bring work on the Bae Nimrod, Bae Systems Regional Jet and on tooling for the Eurofighter. Sections of the Gripen are expected to be built by local industry including the rear fuselages and wing-attachment sets and drop tanks, while developing the export version for other airforces.

There are downsides to these deals, some of which have been highlighted above. While the civilian offsets may provide longer-term benefit (if they work out as envisaged), many of the deals as structured are capital intensive of foreign imports in the construction of plants to provide offset value. There are also serious questions about the profitability of some of the suggested new enterprises. For example, the stainless steel mill to be built in terms of the offset on the submarines in the Eastern Cape, it is speculated, might reduce the profitability of existing companies and flood the domestic market while running into difficulties accessing international markets because of anti-dumping legislation. There is also the omni-present danger with counter-trade deals that the foreign investors could pull out of their commitments; in the South African case excusing this on the grounds of the narrow stipulations presented by the South African government. Finally, the nature of the offset programs also raises questions about the desirability of having government involvement to this degree in commercial projects of this nature. It may not have the technical or the bureaucratic capacity to decide on nor monitor effectively such investments.¹³

Whatever these debates, importantly, however, as Flip Botha has acknowledged, the inclusion of Denel into such an international network will “provide a substantial base workload...which through high quality, competitively-priced services, can be expanded into further international markets”.

Arms Sales

With the reduction in domestic defence spending in the 1990s, South Africa’s arms industries have become more dependent on international markets. The size of the defence market has declined by approximately 70 per cent in real terms between 1989 and 1997. Purchases by Armscor peaked at R3.6 billion in 1989/90, declining to R1.7 billion in 1996/97.

Access to international markets was, of course, facilitated by the political change inside the Republic and the dropping of the UN embargoes in 1994. However, South Africa has not been able to penetrate international markets to the extent expected, as a result of both extraneous factors (such as the decline in global demand) and strict local controls imposed through the establishment of the National Conventional Arms Control Committee (NCACC) after 1994. The value of exports has, however, increased from around R163 million in 1990 to R721 million in 1995, R1.3 billion in 1997, around R1 billion in 1998, and rose more gain by 25 per cent to R1.27 billion in 1999.¹⁴

Details of South African arms sales are now openly supplied in terms of four categories: Category A is sensitive major significant equipment, Category B is sensitive significant equipment, Category C is non-sensitive equipment and Category D is non-lethal equipment.¹⁵ In 1998, more than half of its sales were in the most sensitive Category A, worth R396.6 million. In 1996, R323.3 million out of R517.03 million was Category A. In 1997, this figure was R1,033.4 million out of R1,324.9 million.

In terms of the recipients, Algeria purchased R849 millions' worth of arms in 1998, nearly all in the highly sensitive Category A. Other major purchasers of South African weapons in 1998 were: the US (R36.2 million), Thailand (R67.1 million), Switzerland (R66.2 million), Rwanda (R19.5 million), Peru (R30.1 million), Denmark (R12.5 million), Colombia (R44.6 million), Brazil (R26.2 million) and Australia (R10.5 million). South Africa sold arms worth R12.3 million, with R7.3 million in Category A, to India. It also sold arms to the value of R10.04 million, with R2.4 million in Category A, to Pakistan.¹⁶

Denel continues to see the export market as one of growth, particularly in the areas of ordnance and aerospace, increasing export market share of these sectors from the current level of 41 per cent in the 2000 financial year from 33 per cent in corresponding period in 1999. In particular, according to the deputy CEO Max Sisulu, the organisation expects "to do well in Europe, the Gulf states, India, Malaysia, Africa and Latin America". The group is also confident of a major artillery system order in 2000.¹⁷

Future Requirements?

The future of the South African arms industry will depend both on the international links struck through domestic purchases from international suppliers, and on South Africa's future requirements, detailed below.¹⁸

1. The South African Air Force

The SAAF has a number of formal requirements in place, but its force design has been subject to ongoing change. The most likely mix of near/medium term requirements is set out below, together with some clear needs that have not yet become requirements:

- Maritime patrol aircraft to replace the unsuitable and inadequate turboprop Dakotas.¹⁹ This is currently seen as the third most important priority after the medium transport aircraft and short-range air-to-air missile. The need is for a mix of long-range and coastal types. The planning dates for the original mix of medium and long-range

types were 2005 and 2008, though new aircraft will only be acquired by 2010. By mid-2000, it appears most likely that a four-engined aircraft will be employed in this role, probably the three C-130s that were sourced from the US Navy, given the limitations on single-engine flying range over sea. The P-3 Orions, which have been offered at low (no) cost by the US Navy, are seen to be unsuitable due to the age of the avionics and high levels of stress and corrosion of the airframes.

- **Medium transport aircraft (50-seaters).** There is a need to improve the type of aircraft that could provide STOL battlefield support such as the Transall C-160s or CASA-235s. There is a requirement for probably eight aircraft from 2003 onwards. The preferred types include the CASA C-235 or the FIAT/Lockheed C-27J, although the Antonov An-74 or An-140 is also a possibility. There is apparently little prospect of reinstating – as an interim measure – the nine C-160 SAAF Transalls retired in the early 1990s.²⁰ The use of such aircraft (or the CASA C-235s) would open up an estimated further 200 airfields in Southern Africa for operational usage when compared to the C-130s.
- **Medium heavy transport aircraft (90-seaters).** The planned medium-heavy transport fleet of 12 C-130s is seen by some analysts as “clearly not adequate, despite current SAAF protestations” and “will have to be expanded to around 20-24 aircraft if the SAAF is to meet the demands that will arise from regional missions and commitments”.²¹ However, the SAAF has pointed out that its nine operational C-130s (seven original aircraft, plus the five acquired from the US of which two are operational) are currently flying only 200 hours each per annum. In reality the ongoing SANDF funding shortage is unlikely to make this item an immediate procurement priority.
- **Medium-light transport aircraft.** Probably 12 aircraft from 2002 onwards. The original requirement was for 20 to enter service between 2001 and 2008, though this is now unlikely to commence as soon as envisaged. The preferred type is apparently the CASA C-212.
- **Communications/VIP aircraft.** The HS-125s have been discarded and need to be replaced by a similar type. No firm time-scale has been attached. There is also a requirement for a second presidential aircraft with inter-continental range, a decision that should be reached in 2000.
- **Airborne surveillance and ELINT.** A replacement of the Boeing 707s will have to be sought within ten years, partly because of the high emission levels of the engines.

- Light utility aircraft. The original requirement was for some twenty-four aircraft to replace the Cessna-185. Although some Cessna 185s have been modernised, this requirement remains for 2002, given the need to upgrade sensors for effective border protection and police co-operation.
- New/additional fighters: The fighter force will, if found inadequate, be met by expanding the number of Gripens.
- Short-range infrared air-to-air missile. This is a short-term requirement, where the cost per round is critical, as is the reliability of supply.

2. *The South African Navy*

The naval force for the foreseeable future will comprise: six strike-craft operational until 2010; four mine-sweepers; four mine-hunters; four corvettes/frigates; three submarines and two combat support vessels. There are thus no short term major requirements open, apart from the replacement of the Ton class mine-sweepers, but that could be met by acquiring, in 2000, four ex-German Navy Type-351 MCMVs (plus two spare vessels)², albeit only as an interim solution. Looking to the longer term, there are a number of requirements, including:

- A replacement for the six Reshef/Warrior-class strike craft now being upgraded and due to retire from 2010. If funded, this would arguably be best met by extending the patrol corvette order to six to eight ships. This is the Navy's preferred option.
- Mine-countermeasures vessels, to replace the four River-class and the four German Type-351 MCMVs. These are likely to be built locally to a Western Navy design. This is unlikely to happen before 2015 or even 2020.
- There is a need for more than four patrol corvettes – six is the operationally practical minimum – and for a fourth submarine. But both will be met, if at all, by acquiring the same types as currently in hand or planned.
- In the longer term the Navy will need a second replenishment ship to complement the locally-built 12,500 tonne *SAS Drakensberg* and then ultimately a new ship to replace the *Drakensberg*.
- The Navy also needs, but will not necessarily get, amphibious capability. If authorised, that requirement would be best met by a newly-built ship to one of several designs currently being offered by France,

Singapore, Spain/Holland, Italy, Germany and the UK. This capability was offered to South Africa recently by the US government in the form of the 8,500 tonne Newport-class Landing Ship Tank (LST), though this was considered by the SAN to be “steam technology” with associated maintenance and personnel problems.²³

3. The South African Army

The intention for the future is to manufacture most Army equipment locally and almost certainly to Western designs. The South African Army is about to begin a major “planned capital renewal program” which follows the recently approved equipment programs for the Air Force and Navy.²⁴ Defence Minister Mosiuoa Lekota argued in his 2000 budget speech that this would be a “primarily domestic acquisition program”. This will bring orders for South African-based companies including Denel, Vickers/OMC, African Defence Systems (ADS) and the Grintek group, and many smaller companies. As Helmoed-Romer Heitman has noted, this will create considerable business potential for foreign companies whose equipment will be manufactured in South Africa, in the form of sub-systems and components, or as development partners.

Current planning envisages programs running over a period of some 15 years, commencing from around the middle of this decade. Key elements will be some 95 new Main Battle Tanks (MBTs), between 200-300 new Infantry Combat Vehicles (ICVs) to replace the Ratel, more than 1,000 new mine-protected Armoured Personnel Carriers (APCs) to replace the Buffel and Casspir, a Man-Portable Air Defence System (MANPADS) and a Short-Range Air Defence System (SHORADS), and several hundred tactical logistic vehicles. The Army will also be acquiring ADS’ AS-2000 artillery target engagement system, a new anti-tank missile, and an automatic 40mm grenade launcher, as well as an upgrade of some existing systems. Other programs, such as new tactical communications equipment, are already in the production stage.

In summary, the possible new acquisitions outside of the current packages include:

Navy: Item	Possible Suppliers	Horizon
Two 10,000 tonne amphibious LPH-type	Civilian specification, helicopter and troop carriers.	2005-2010
Strike-craft replacement	Two additional corvettes? Or local production?	2010
Four MCMs	Local construction; German design?	2015-2020
4/5 Maritime Helicopters	Lynx/Seasprite	2000

Airforce: Item	Possible Suppliers	Horizon
Maritime Patrol Aircraft	4-8 (C-130/BE200/P3?)	2010
Medium/Medium-Heavy Transport Aircraft	8-12 (CASA C-235/ C-160 /C-130/ An-74/C-27J/ An-70?)	2003>
Medium-Light Transports	12 (CASA-212/?)	2001>
VIP Aircraft	2-5	2000>
Fighters	28+ Gripen	2008>
Light Utility Aircraft	24	2002>
IFR Missile	local	2000>
ELINT	2	2010
Army: Item	Possible Suppliers	Horizon
MBTs	95 (Challenger, Le Clerc, Leopard, Abrams)	2003>
ICVs	200-300 (8x8, Piranha, MRAV)	2003>
Tank Destroyers	72 to ICV hull, Kentron Ingwe Missile System; interim solution fit Ingwe to Ratel?	2003>
APCs	1.000+	2005>
Light Airborne Vehicle	Pallet dropped	2001>
MANPADS	Light SAM. One battery (12 launchers), later four batteries	2006>
SHORADS	Kentron SAH3/ Umkhonto. One regiment of four batteries	2006>
Logistics Vehicles	17-ton cross-country capable	2005>
Infantry Weapons	Milan Replacement/Ingwe?	2005>

Global Defence Equipment Trends and Middle Power Options

As has been demonstrated above, South African defence manufacturers have experienced a period of reorganisation and reorientation. With the ending of the embargo on the export of military equipment to the country, the South African armed forces have been able to go into the international arms market and exercise some choice over the equipment that best meets their needs. Furthermore, for almost the past decade, it has essentially been a buyer's market for military equipment. This has meant that potential customers, South Africa among them, have been able not only to access some of the most modern and latest equipment but also to negotiate some very hard bargains.

Although South Africa is not alone, in this, the off-set and counter-trade deals that the South African armed forces were able to get - necessary under the political circumstances at home - have been among the most generous and economically advantageous of any. Whether or not the inward defence and industrial investment associated with these deals were the most suited

to South Africa's current social and economic needs is a secondary consideration; the important point is that those deals were able to be struck. One outcome, as noted above, is that attached to the military equipment purchases from abroad - particularly Britain, Germany and Sweden - is the opportunity to be involved in the production and assembly of that equipment, thereby benefiting from much needed technology transfer.

However, it has to be remembered that the market will not always be a buyers one or that the military equipment currently available will be the most relevant or appropriate either for South Africa's future needs or those of other equipment client states. The simple fact is that the advanced equipment now available from the world's major arms manufacturing states is the equipment that was specified, developed and manufactured during the latter stages of the Cold War. The frigates, fighter aircraft, jet trainers submarines and helicopters that made up four acquisition 'packages' in September 1999 are all products of a previous generation. Although they are either in the inventories of the vendor states or are scheduled to enter service in the near future, some analysts argue that the days of such acquisitions are numbered because the nature of international conflict and the manner in which wars are likely to be fought are rapidly changing.

The international arms market is effectively changing in parallel with the changes occurring in the use of armed force. As Arvin and Heidi Toffler have argued, the conduct of war, or the manner and equipment with which it is fought, reflects the foundation upon which a state's wealth is created. Thus, in the United States and in the major states within Europe, the military equipment that was the product of both the industrial (mass production) and technical (nuclear, radar and jet propulsion) revolutions is being rapidly replaced with the information technology (sensor and computer) revolution, otherwise referred to as the 'Revolution in Military Affairs'. For these states, the next generation of equipment will be based on information technology and the ability to be able to dominate the battlespace through superior intelligence, knowledge and access. This will not require huge numbers of military personnel, a huge industrial surge capability or the sorts of military formations that characterised forty years of NATO and Warsaw Pact forces on the European Central Front. The ability to know what is going on in a theatre of conflict and to pre-empt, with special forces and precision weapons launched (possibly from unmanned combat vehicles) are the top priorities, whether launched from air, land or sea and subsea forces. These developments are also compatible with social developments in which the general population is progressively less prepared to support long and costly wars and for whom military service has all but lost its attraction.

If prognoses of future weapons set the leading defence manufacturing states from the rest - of which South Africa is one - the same cannot be said quite so emphatically where future war is concerned. Martin Van Crevelt was among the first, and many have followed his lead, to argue that large scale, inter-state conventional wars, whether or not backed by the threat of tactical nuclear weapons, are very much a thing of the past. Future conflict will be small scale, internal, asymmetric, highly politicised and fought between non-state groups and national governments.

The connection between these sorts of internal conflicts and the international community's, and United Nations', predilection for peace-keeping operations was not noted at the time, but it has since become something of a reality. The challenging experiences of the Balkans, the Middle East and central Africa have set a firm precedent for international intervention irrespective of articles of the UN Charter stipulating otherwise. Peace keeping and peace enforcing in internal conflicts, which threaten to destabilise countries and regions, have become a priority for the world's major military and economic states. It is a policy that has been packaged with expressions of 'defence and preventive diplomacy'. Peace keeping and enforcement is high on the agenda of the Organisation of African States and is also one of the approved roles for the South African National Defence Forces, after the defence of sovereign territory.

If the sort of wars is expected to change, and if the forces engaged are working in coalition, and if the weapons used are smart, precision and light equipment backed by IT sensors, networks and computers, where does that place states like South Africa with a competent, but not state-of-the-art, defence manufacturing base? And what sorts of military equipment should South Africa be trying to research and develop itself, particularly if the future roles of its armed forces are likely to be combating domestic violent conflict, defeating or controlling or suppressing organised illegal activities and supporting peace-keeping operations in the more querulous parts of the continent?

Ironically, when South Africa was still a pariah state and isolated from the international community, it had to develop its own defence industries as best it could. Among the more visible achievements were adaptations of French fighter aircraft, an armed attack helicopter and, arguably, one of the world's best artillery pieces. Less well known was the work done on unmanned aerial vehicles, in which it was once a world leader, and in combat systems, and here there is a potential future for the South African defence manufacturers. The combat suite that was developed within South Africa from commercial sources and installed in the ageing Daphne subma-

rines was as effective as any of those that the major states had in their inventory at the time. Most significantly, the parts that went into these command and control and combat systems were accessed from the commercial electronics market, the very same source for many of the world's leading defence equipment manufacturers.

There is more than just an American 'Revolution in Military Affairs'. Within the next two decades, the world demand for IT systems, computers, sensors, unmanned and guided weapons, and smart munitions will not only increase, but also become an integral part of the 'globalisation of security' primarily under UN auspices. This is not to suggest that there will not be a requirement for the conventional heavy combat weapons of the Cold War, but these will be used as weapons of last resort and in limited numbers.

This will present middle powers, such as South Africa, with a dilemma. Would it be better to acquire the technical skills and production capability to continue to manufacture and hope to sell conventional land and air equipment in a highly-competitive and over-supplied market; or to look to develop indigenous capabilities relevant to future requirements and markets in the new defence related technologies? In seeking an answer to this question, it must be remembered that the dual use of sensors and IT surveillance capabilities is as relevant to the maintenance of internal law and order as it is to support international peace-related engagements. Furthermore, it is these technologies that provide the value-added element to weapons platforms and potentially the best return in the international market place. The manner in which the South African defence manufacturers manage and embrace the opportunities opened up in the offset arrangements currently in place will give a pointer to the direction the country will go. Of some significance is the fact that future cooperation with the arms industries of Europe, and possibly North and South America, would be more easily achieved in the new technologies that the older, more conventional ones.

Conclusion: Between Domestic Demand and International Linkages

The South African government is committed to linking with major Western powers in terms of defence cooperation and technology. There is a fear that further diversification of acquisition would produce far too many support and training problems. Thus political, technological, technical (support) and military considerations all push South Africa strongly towards staying with Western equipment and expanding these links. With regard to the South African Army, the intention of the government is that its main equipment programs should be handled as national programs to benefit local industry as much as possible.

In spite of burgeoning local requirements, the future for the South African industry lies in tapping into the global market specifically through the joint ventures established as a result of the 1999 defence packages. This development, and the opportunities offered by privatisation, present a global future, though South African industry's role is likely to be only as a sub-system rather than whole system provider.

Globalisation has brought tremendous challenges for smaller, often uncompetitive, countries. The mergers and acquisitions that have paralleled this phenomenon have arguably further marginalised the smaller industries. For example, as a result of such consolidation, the US aerospace industry is today dominated by Boeing, Raytheon, Lockheed Martin and Northrop Grumman, ensuring their market dominance as both systems providers and integrators. In Europe, the formation of EADS and Bae Systems has created two major industrial poles, controlling more than two-thirds of defence work in the UK, France, Germany, Italy, Spain and Sweden.

Much thus depends on what happens in terms of the benefits of the defence packages and the state of global defence market. As Flip Botha has put it, the procurement of major defence systems through Defence Industrial Participation will create new opportunities for smaller countries and defence manufacturers which today "cannot be prime contractors for major systems". This will allow them to play "roles from supplying niche products as sub systems to the primary contractor, including being technology partners in these niche areas. They could also become maintenance providers in their countries for the systems procured".

Notes

2. Denel, ATE, Grintek, ADS and Reutech are considered to be the 'Big Five' of the South African arms industry.
3. Figures Supplied by the SANDF, January 2000.
4. For background on the SA arms industry, see Signe Landgren, *Embargo Disimplemented: South Africa's Military Industry*. London: OUP, 1989; and James P McWilliams, *ARMSCOR: South Africa's Arms Merchant*. London: Brassey's, 1989.
5. In 1990, South Africa announced that it had dismantled six complete and one partially-assembled 'devices'. There were roughly 1,000 South Africans who worked on this Armscor-directed program, which utilised Highly Enriched Uranium produced at the Valindaba Enrichment Facility employing an indigenously-developed technique. The reason given for developing the program was to assure the West's continued interest in safeguarding the white regime's interests by posing a threat. If the West pressurised South Africa or supported its enemies, then the weapon could be deployed. Who and what might have been the target remains a matter for speculation, though the Cuban forces in Angola are sometimes mentioned as one possibility.
6. See 'Compa-e-e-s! By the centre.. all join arms', *Financial Mail*, 29 January 2000; and 'Strategic Decision', *Flight International*, 29 August-4 September 2000, p.47.
7. This is planned to occur along with the sale of the other 'Big Four' South African parastatals – Eskom (electricity supply), Telkom (telecommunications) and Transnet (railways and harbours) – by 2004.
8. See, for example, 'Taking a closer look at SA's arms deal', *Business Day*, 20 November 1999. For example, it has been alleged that the family of Armscor acquisitions executive, Chippy Shaik, have personally benefited from the deals. See also Ivor Powell, 'Nepotism in R32 billion arms deal', *Mail and Guardian*, 26 May – 2 June 2000.
9. The total cost of the equipment package is R21.3 billion over eight years. If the option to procure additional equipment is exercised, the total equipment cost will rise by R8.5 billion to R29.9 billion over 12 years. The options must be exercised by not later than the year 2004. The industrial participation (IP) projects linked to the purchase deals will reportedly yield significant economic benefits for South Africa, with total contracted commitments amounting to R104 billion, composed of: defence industrial participation (DIP) offsets (about 20% of the total, or R14.5 billion); counter-purchase by the defence equipment suppliers of South African goods (about 45%, or R31 billion); and national (civilian) industrial participation (NIP) investments in South Africa by companies associated with the equipment suppliers (the remaining 35% or R24 billion). There is also both direct DIP (the production and/or assembly of components of the weapons systems ordered) and indirect DIP (unconnected with the SANDF's systems, but

- also for SA-based defence-related companies). For details of the packages, see, <http://www.polity.org.za/search/Default.asp>.
10. *Business Day*, 16 September 1999.
 11. The Spanish firm CASA offered eight C-235s and eight C-212s in 1998 for US\$200 million, with a buy-back offer on the SAAF's existing four C-212s and single C-235.
 12. See, for example, Flip Botha, 'Defence Industrial Participation and National Participation Opportunities for the Aerospace Industry'. Paper presented at the Sir Pierre van Ryneveld Air Power conference, 4 September 2000.
 13. See Greta Steyn, 'Defence package holds hidden risks for the economy', *Business Day*, 2 May 2000.
 14. See 'Denel lifts exports 26.4% to R1.3 billion', *The Star*, 17 August 2000; 'Defence market smaller, more concentrated', *Business Day*, 21 December 1999.
 15. Category A, sensitive major significant equipment, "comprises conventional implements of war such as explosives, large calibre arms and automatic weapons, guns, missiles, bombs and grenades, tanks, fighter aircraft, attack helicopters and naval vessels that could cause severe casualties and/or major damage and destruction". Category B, sensitive significant equipment, "comprises all types of infantry hand held and portable assault weapons and associated ammunition of a calibre smaller than 12,7mm".
 16. See http://www.mg.co.za/mg/news/99oct1/1oct-arms_military.html.
 17. See 'Denel lifts exports 26.4% to R1.3 billion', op cit.
 18. This section is drawn in part from Greg Mills and Sara Pienaar, 'Nazdarovye? Russian-South African Defence and Technology Ties', *Defense Analysis*, (Winter 2000). See also 'Celebrating change', *Flight International*, 29 August-4 September 2000, pp.48-9.
 19. The Dakota TPs not only have a limited range, but the aircraft have two other major failings: first, they apparently leak, with negative consequences for the equipment carried; second, they cannot carry the surveillance system developed for them in the 1990s. There are also reportedly problems with the airframes cracking. By August 2000, only one of 11 Dakota TPs was configured for maritime patrol, and was undergoing technical evaluations. An additional four aircraft are to be similarly equipped and made ready for service by March/April 2001. The remainder will be used for transport purposes or held in reserve.
 20. In the opinion of many, the retirement of the C-160s was a "tragic miscalculation" given both South Africa's current requirements and the C-160s capabilities (short take off, and the ability to ferry an Oryx without, unlike the C-130s) having to remove the rotor head), but also because of the manner in which this occurred. These aircraft were retired on the basis of an internal SA Air Force audit conducted in the early 1990s. The common denominator in determining which aircraft types were to be retired was lifecycle cost. Two C-160s had been landed 'wheels up', and the repair costs

were included in the standard scheduled maintenance cost, with all the negative implications. This was only discovered after the aircraft were withdrawn from service. The airframes have apparently only relatively low hours and the previous problem of the acquisition of spares encountered during the apartheid (sanctions) years is no longer. There have been at least two attempts to bring the C-160s back into service, once as a maritime patrol aircraft. The aircraft are currently out to tender. The cost of re-certification is estimated at US\$5 million per aircraft for what is described by some officers as "an old lady", whereas a new aircraft will cost US\$18 million. Moreover, the C-160 was designed for European rather than the "hot and high" conditions encountered in Southern Africa. Interviews, current and past SAAF officers, July 2000.

21. Discussion, Helmoed-Romer Heitman, April 2000.
22. At an estimated cost of only US\$150,000 each
23. Interview, SAN HQ, July 2000.
24. See Helmoed-Romer Heitman, 'South African Army Re-Equipment', *Jane's Defence Weekly*, 3 May 2000.

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The aim of the Strategic and Defence Studies Centre, which is located in the Research School of Pacific and Asian Studies in the Australian National University, is to advance the study of strategic problems, especially those relating to the general region of Asia and the Pacific. The centre gives particular attention to Australia's strategic neighbourhood of Southeast Asia and the Southwest Pacific. Participation in the centre's activities is not limited to members of the university, but includes other interested professional, diplomatic and parliamentary groups. Research includes military, political, economic, scientific and technological aspects of strategic developments. Strategy, for the purpose of the centre, is defined in the broadest sense of embracing not only the control and application of military force, but also the peaceful settlement of disputes that could cause violence.

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