



DEFENCE

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A review of South Africa's defence sector

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Gripen fighter jet at the Makhado Airforce Base, in South Africa's Limpopo province

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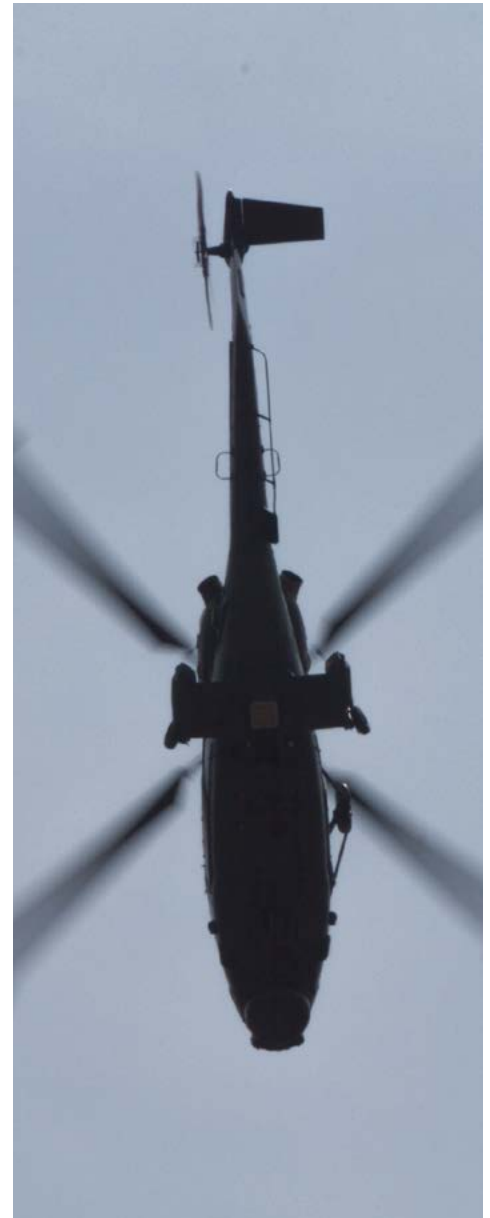
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List of abbreviations

| | |
|--------|---|
| AEEI | African Equity Empowerment Investments |
| AHRLAC | Advanced High Performance Reconnaissance Light Aircraft |
| ARA | Antenna Research Associates |
| Armcor | Armaments Corporation of South Africa |
| CSIR | Council for Scientific and Industrial Research |
| DAe | Denel Aerostructures |
| DISM | Denel Integrated Systems and Management |
| DLS | Denel Land Systems |
| EW | electronic warfare |
| GDP | gross domestic product |
| IDC | Industrial Development Corporation |
| ISS | Institute for Security Studies |
| JCoE | Joint Centre of Excellence |
| LSSA | Land Systems South Africa |
| MoU | memorandum of understanding |
| NPF | Nigeria Police Force |
| NTSC | National Training and Simulation Centre |
| OEM | original-equipment manufacturer |
| OTR | Overberg Test Range |
| PMP | Pretoria Metal Pressings |
| R&D | research and development |
| RDM | Rheinmetall Denel Munition |
| SANDEF | South African National Defence Force |
| SAR | synthetic aperture radar |
| Sara | South African Regional Aircraft |
| Sipri | Stockholm International Peace Research Institute |
| UAV | unmanned aerial vehicle |
| UN | United Nations |



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Key developments

July 2014: Denel Aerostructures wins a fourth contract to manufacture parts for the Airbus A400M military air transport and air-to-air refuelling aircraft. The new contract is worth more than R260-million and will run for six years.

July 2014: US company Boeing Defence, Space and Security, a unit of the giant Boeing Company, and the Paramount Group sign a memorandum of collaboration, in terms of which the two companies will jointly work on opportunities in the defence and security sectors in important international markets.

July 2014: The Paramount Group reports that the Advanced High-Performance Reconnaissance Light Aircraft has reached the ground-testing phase, which is being conducted out at South Africa's Wonderboom Airport, in Pretoria, Gauteng.

August 2014: BAE Systems and Denel announce that BAE Systems will sell its South African armoured and mine-protected vehicle and related systems subsidiary BAE Systems Land Systems South Africa to Denel.

September 2014: DCD Protected Mobility unveils its latest product, the Oribi multirole utility truck.

September 2014: The Paramount Group announces its acquisition of Aerosud Aerospace and Veecraft.

September 2014: Rheinmetall Denel Munition signs a teaming agreement with Indonesian State-owned entity PT Pindad, which is expected to facilitate further cooperation between the two companies and encompass several product groups, as well as training requirements.

October 2014: Armscor hosts a bidders conference for shipyards interested in building a new hydrographic vessel for the South African Navy.

October 2014: The Council for Scientific and Industrial Research announces that it is partnering with local company Space Commercial Services Holdings Aerospace group to develop a maritime wide-area synthetic aperture radar for use by small satellites.

October 2014: South African aerospace companies Denel Aerostructures and Denel Aviation unveil a major new project – the South African Regional Aircraft. The project aims to meet a gap in the global market, preserving South Africa's aerospace design and development capabilities, and stimulating the country's young aerospace engineers and technicians.

December 2014: The Council for Scientific and Industrial Research and Algeria's University of Blinda agree to set up a Joint Centre of Excellence for aeronautics work.

February 2015: The Paramount Group concludes a deal with Jordan's State-owned defence company King Abdullah II Design and Development Bureau to manufacture fifty 6 × 6 Mbombe infantry combat vehicles in Jordan and South Africa.

February 2015: Paramount Group signs a memorandum of understanding with Ukraine helicopter maintenance and repair organisation Motor Sich Joint Stock Company to collaborate on the production and modernisation of helicopters and aviation engineering components.

March 2015: Denel Integrated Systems & Management forms an alliance with GEW Technologies, a South African subsidiary of Airbus Defence & Space, part of Europe's Airbus group. The alliance is intended to pursue future electronic warfare programmes.

March 2015: Saab Grintek Defence indicates that it will produce Integrated Defensive Aids Suites for the Indian Army and Air Force's Dhruv Advanced Light Helicopters, manufactured by Hindustan Aeronautics. Deliveries will take place between 2015 and 2018.

April 2015: Armscor extends the deadline for bids to build a new hydrographic vessel for the South African Navy to the end of June 2015.

April 2015: Denel Aerostructures signs a memorandum of understanding with Strand Aerospace Malaysia covering knowledge transfer and possible subcontracting work.

April 2015: Denel completes its acquisition of Land Systems South Africa from BAE Systems.



Key developments

(continued)

April 2015: The Joint Standing Committee on Defence adopts the Defence Review, taking the policy a step closer to adoption by Parliament.

April 2015: The Paramount Group announces that it has bought the manufacturing facilities and certain other assets of DCD Protected Mobility.

May 2015: Minister of Public Enterprises Lynne Brown indicates that Denel's order book stands at more than R33-billion, with more than 50% of the company's profits being derived from its international business.

June 2015: The National Assembly passes South Africa's Defence Review.

July 2015: South African State-owned defence industrial group Denel reports that it has enjoyed a most successful financial year during 2014/15. The group's revenues rose by 28%, or by more than R1.3-billion, to R5.85-billion.

July 2015: South African Public Enterprises Minister Lynne Brown, following Cabinet approval, rotates the board of State-owned aerospace and defence technology conglomerate Denel.



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Introduction

In early June 2015, South Africa's National Assembly passed the Defence Review, which outlines the country's long-term defence policy and strategic trajectory. The review indicates that current levels of local defence spending have contributed to the defence force being in a critical state of decline. With the local market being an important source of demand for the defence industry, this inadequate spending has impacted on local defence companies. The review proposes modest increases in defence spending which, if implemented, will halt the current decline in the capabilities of the South African National Defence Force and, subsequently, allow for the rebuilding of the defence force. Should such spending take place, it will provide support for the local defence industry and contribute to ensuring its continued viability. However, as yet, there is no sign that there will be a meaningful increase in defence expenditure.

While local demand is important to the defence industry, the bulk of local defence-related production is, in fact, exported, with South Africa's defence industry – which is active in the landward, aerospace and maritime sectors – having an excellent reputation in the global market. In addition to their export activities, many local defence companies are also involved in partnerships and joint ventures with international defence operators.

Secretary for Defence and Military Veterans Dr Sam Gulube has indicated that the South African Department of Defence will support the future development of the local defence industry, including the industry's international export efforts. He contends that "a vibrant defence industry is a national asset", and has noted that the local manufacture of defence systems will contribute to South Africa's socioeconomic development.



Secretary for Defence and Military Veterans Dr Sam Gulube has indicated that the South African Department of Defence will support the future development of the local defence industry

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Key participants

The **Armaments Corporation of South Africa (Armcor)** is the State-owned entity responsible for meeting the acquisition needs of the Department of Defence and other organs of State such as the South African National Defence Force (SANDF) and the South African Police Service (SAPS). The acquisition function of Armcor is subdivided into technology acquisition (contracting for and developing technologies), capital equipment acquisition, systems support acquisition and procurement (acquisition of commercial or military off-the-shelf equipment). The acquisition function also involves disposing of surplus equipment, supporting the local defence industry and maintaining a defence industrial participation programme management system.

Major acquisition projects currently being undertaken by Armcor include of a new hydrographic vessel, to replace the SAS Protea, known as Project Hotel; and three inshore and three offshore patrol vessels, known as Project Biro. These projects will reach the tender stage during 2015. Also under way is Project Hoefyster, to supply the army with a new infantry fighting vehicle. The final vehicles in this project will be delivered in 2022.

In addition to Armcor's role in acquisition, it is also involved in research and development (R&D) . These activities take place in nine units:

- Armour Development, the Defence Decision Support Institute and Ergotech, focused on ergonomics technologies;
- Flamengro, a fluid and mechanical engineering group, focused on fluid-flow, structural integrity and signal-processing engineering services;
- Hazmat Protective Systems, focused on respirators and associated systems;
- the Institute for Maritime Technology and Protechnik Laboratories, focused on chemical and biological defence;
- the Gerotek vehicle-testing complex; and
- the Alkantpan weapons testing range.

Armcor regards its R&D activities as strategically necessary, but not commercially viable. Armcor is also responsible for managing and operating the country's naval dockyard, in Simon's Town, in the Western Cape.

The dockyard provides third-line maintenance and refitting for the South African Navy's vessels and some shore facilities. Further, Armcor provides support functions relating to finance, infrastructure, human resources and quality. It also provides defence support, which covers anything from registering military vehicles to operate on public roads to arranging for SANDF personnel and equipment to participate at international exhibitions in support of the defence industry.

In mid-2014, South Africa's Constitutional Court upheld Defence Minister Nosiviwe Mapisa-Nqakula's dismissal of Armcor's chairperson Mojo Motau and deputy chairperson Refiloe Mokoena. The Minister justified the dismissal by noting that various procurement projects had failed to progress timeously as a result of board decisions or inaction. Further, the dismissal was linked to complaints received by the Minister about Armcor from the defence industry, indicating that the relationship between the two had broken down.

Since that time, a new chairperson, Johannes Mudimu, and board of directors have seemingly made a positive impact on Armcor, with estimations indicating that the entity would have achieved its projected cash flow for the financial year by March 2015. A new CEO, Kevin Wakeford, joined the company in May 2015.

State-owned **Denel**, which operates in the military aerospace and landward defence environments, is the largest manufacturer of defence equipment in South Africa. The company is an important supplier to the SANDF, as an original-equipment manufacturer (OEM) and in refurbishing, maintaining, repairing and upgrading the SANDF's equipment, as well as supplying many international customers.

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New generation Denel Rooivalk attack helicopter under consideration

At a media briefing in July 2015, State-owned defence industrial group Denel expressed its hopes that the Department of Defence and the South African National Defence Force would give a favourable response to the proposed "future roadmap" for the company's Rooivalk attack helicopter.

Group CEO Riaz Saloojee highlighted that the Rooivalk had enjoyed great operational success in combat operations in the Democratic Republic of the Congo, where a detachment of South African Air Force (SAAF) had served as part of the United Nations forces. Saloojee pointed out that the SAAF Rooivalks had played a decisive role in defeating rebels in that country.

Currently, 11 Rooivalks are in operational service with the SAAF, with 16 Squadron; a twelfth was written-off in an accident. Three prototypes were also built. The proposed roadmap would include upgrading the existing helicopters and developing a new version.

"It's probably one of the two best attack helicopters in the world," he emphasised. "It does not make sense for us not to pursue a roadmap for this system going forward."

"It is a very credible attack helicopter. The Minister of Defence has been saying that we should nurture this, not only operationally but technologically." The existing aircraft are already quite old and need upgrading. The proposed Rooivalk Mark (Mk) 2 would effectively be a completely new attack helicopter, although it would be based on the existing machine, Saloojee explained.

A Rooivalk Mk 2 programme would require funding and the company hopes to have a response from the government within the next six months. "From a Denel point of view, we would be extremely pleased if they decided to develop the Rooivalk Mk 2."



Denel's Rooivalk attack helicopter is broadly recognised as the best-of-breed among combat helicopters

Picture by Duane Daws

Source: *Engineering News*

Denel's core operating divisions include Denel Aerostructures (DAe), Denel Aviation, Denel Dynamics, Denel Integrated Systems and Management (DISM), Denel Land Systems, Denel Overberg Test Range, Denel Pretoria Metal Pressings (PMP) and LMT Holdings. It also has associated companies – Turbomeca Africa, Airbus Optronics, Land Systems South Africa (LSSA), Rheinmetall Denel Munition and Tawazun Dynamics.

DISM is Denel's newest division, having been established in late 2014. The division will focus on the sovereign defence capabilities outlined in the Defence Review, including command and control, electronic

warfare (EW) and secure communications; the maritime domain, focusing on the integration of mission systems, naval support and assisting the Armscor Dockyard; and the national and civil security sectors.

Denel group CEO Riaz Saloojee has noted that establishing a presence in the maritime environment is a natural next step for Denel. He contends that the company has been a global name in landward defence for several decades, as well as a leader in the development of long-range artillery and mechanised infantry vehicles. "In the aerospace sector, we designed, developed and manufactured the Rooivalk, which is broadly recognised as the best-of-breed among combat

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helicopters . . . Denel's greatest strength is to integrate different systems . . . With DISM, we now close all the gaps and offer the South African and global security markets a single point of entry into an all-inclusive defence solution," says Saloojee.

Since its establishment, DISM has formed an alliance with GEW Technologies, a South African subsidiary of Airbus Defence & Space, part of Europe's Airbus group. The alliance intends to pursue future electronic warfare (EW) programmes.

Also new in the Denel stable is LSSA, which was acquired from UK-based global defence group BAE Systems and its partner DGD Technologies in April 2015. BAE Systems owned 75% of the local armoured and mine-protected vehicle company and DGD Technologies 25% of the company. The total acquisition cost for Denel was R855-million, including the payment of R641-million in cash to BAE Systems. Denel has noted that, with the acquisition of LSSA, the entire landward mobility capability of the SANDF is, once again, invested in the State. LSSA specialises in the design and manufacture of armoured and mine-protected vehicles, drivetrains for military and civilian vehicles and heavy equipment, and remote weapon-launching platforms, subsystems and products.

Meanwhile, Denel Dynamics has indicated that at least three of the development projects it has been pursuing – the A-Darter missile, the Seeker 400 unmanned aerial vehicle (UAV) and the Umbani



Denel Dynamics' Seeker 400 UAV

Picture by Duane Daws

precision guided bomb kit – are coming to an end and being transformed into industrialisation and production programmes for local and foreign customers.

Denel PMP indicated in mid-2014 that it planned to dramatically increase its ammunition production capacity to double its yearly turnover to more than R1-billion in the next five years, which would involve a plant renewal programme to modernise its machinery and munitions production processes. The company has a "very productive" relationship with the SANDF and Armscor, and intends building a similar relationship with the SAPS, metropolitan police forces and the private security industry. The company claims it can meet almost the entire local demand for small-calibre ammunition in the defence and security sectors.

DAe, which is greatly involved in the Airbus A400M military airlifter programme, has been pursuing a turnaround strategy to bring it to breakeven point in 2016. The turnaround strategy, which has already resulted in a significant reduction in the losses being recorded by DAe, involves the renegotiation and restructuring of nonprofitable contracts for the A400M, an overhaul of the financial management and internal control systems, a restructuring of the company's supply chain and an initiative to secure new business.

Further, Denel as a whole has been engaged in a turnaround effort. In 2011, the company posted an operating profit for the first time in more than a decade, and in 2014 announced its fourth consecutive year of profits. For the 2014/15 financial year, the group's revenues increased by 28%, or by more than R1.3-billion, to R5.85-billion. Net profit reached R270-million, an increase of R76-million over the 2013/14 financial year. Exports accounted for 52% of the group's revenues. Further, it's order book stands at an estimated R35-billion, from just R4.07-billion in 2009.

Outgoing board chairperson Martie Janse van Rensburg credited the success of the turnaround to four main elements. "A singular focus on the drivers that would make a difference," was the first. Then teamwork between the board, the executive and the employees, all working together to achieve the same goals. The attitude and support of the shareholder (government) was next, with government now seeing Denel as a strategic asset. The fourth element was governance – the board understood its role and did not try and act

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Brown rotates Denel board

South African Public Enterprises Minister Lynne Brown, following Cabinet approval, rotated the board of State-owned aerospace and defence technology conglomerate Denel in July 2015.

Brown appointed Daniel Mantsha – an attorney with experience in corporate finance, transactional advising, business management, commercial law, media and communication law, administrative law and constitutional law – as nonexecutive director and chairperson, with effect from July 24 for a three-year period.

Johannes Motseki was reappointed to the board “for purposes of continuity”.

Listing new appointments to the board, which would be subject to a yearly review by the Public Enterprises Minister, the department noted that legal adviser to the Home Affairs Minister Thamsanqa Msomi, Gadikala Lodge manager Tauyame Mahumapelo, SV Mahlangu Attorneys director Pinkie Martha Mahlangu and retired Lieutenant-General Themba Michael Nkabinde had been appointed nonexecutive directors.

Former National Prosecuting Authority assistant State accountant Mpho Kgomongoe, Phore Farms MD Khumbudzo Ntshavheni, former Royal HaskoningDHV Engineers CEO Nonyameko Mandindi and Airports Company of South Africa director Refiloe Mokoena were also appointed to the board.

Source: *Engineering News*

as an executive; there was honesty, “lots of robust debate” and trust (between the board, executive and employees), she noted.

Communications and antenna manufacturer **Alaris Holdings**, formerly known as Poynting Holdings, has a defence division, Alaris Antennas, previously known as Poynting Defence & Specialised, which designs and manufactures specialised wideband antennas and other related radio-frequency products. These products sell in the EW, frequency spectrum monitoring, test and measurement, communications and other specialised markets, and find application in the system integration, frequency spectrum regulation and homeland security markets. Alaris Antennas has consistently increased its profit and turnover since its establishment in 2005, and in the year ended June 2014, the division increased its profit after tax by 74% to R15.8-million. All the company’s defence developments take place in house, with its products then being sold worldwide, and it retains all the intellectual property. Nothing is manufactured under licence.

Alaris has indicated that it has a strong drive to diversify geographically, with Europe, Asia and the US being its biggest target markets. It is in the process of acquiring US antenna specialist firm Antenna Research Associates (ARA), which is likely to enable Alaris to expand its US footprint, particularly in the defence market. ARA is considered to be almost a replica of

Alaris Antennas, but with more than 90% of its sales being in the US. In the medium-term, Alaris could expand its European footprint.

South African engineering and electronics company **Ansys** “develops, designs, distributes and integrates niche technology-driven engineering solutions for harsh environments.” The company has four focus areas – rail, mining, defence and telecommunications. The company’s defence division specialises in avionics and communications, simulators and consoles, test equipment and photonics. In the financial year ended February 2015, Ansys’s defence activities generated revenue of R9.9-million, and the segment recorded a profit of R2.7-million. These figures were down on the previous year’s performance, with the company attributing the decline to a “slow start in defence spending from major clients”.

However, the company is expecting an upsurge in defence spending and contends that it is well placed to take advantage of this. In part, this upsurge could be related to Ansys’s acquisition of technology-focused investment company Parsec Holdings, as well as 25% of embedded-solutions specialist Parsec, and 20% of wireless and data specialist Redline Telecommunications. The company has explained that the deal will offer it an opportunity to diversify its income streams by enhancing its mining safety, defence and telecommunications divisions, as well as providing entry into the international

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defence market. Ansys also expects increased work from its defence business, owing to the increased defence spending proposed by the Defence Review.

Aeromechanical parts producer **Aerosud** supplies integrated manufacturing solutions to the global military and commercial aviation industries. The company's capabilities include design, development, prototyping, manufacture and support services for clients, including major global aerospace operators. Aerosud manufactures an extremely diverse variety of parts and assemblies at its plant in Centurion, Gauteng. The majority of the company's contracts are single-source contracts. All are long-term contracts, usually ranging from three to five years and renewable.

Aerosud Holdings has two subsidiary companies – the wholly owned Aerosud Aviation, which is its largest division and the African NDT Centre, in which Aerosud holds 50%; the other 50% is owned by a subsidiary of European airliner manufacturer Airbus.

In September 2014, Aerosud formed a strategic alliance with the Industrial Development Corporation (IDC), in terms of which the IDC took a 26% shareholding in Aerosud Holdings. Simultaneously, the company announced that South African private-sector defence group Paramount had increased its shareholding in Aerosud to 27%.

The existing shareholders (largely the people who founded Aerosud) hold about 29% of the company, and 6% has been allocated to current and new management. The company has also allocated 12% of its shares to an employee trust, defined as a black economic-empowerment trust.

Also in September 2014, Aerosud signed a tripartite memorandum of understanding (MoU) with DAe and Airbus, creating an industrial and research alliance. In terms of the MoU, the three companies will jointly develop industrial projects that will enable Aerosud and DAe to jointly bid for work packages on Airbus airliner programmes that will be larger than the work packages for which each could bid on its own.

Aerosud is on track to achieve a turnover of R1-billion a year by 2016, and has an order book of about R5-billion. It manufactures more than 1.4-million assemblies and parts a year, for companies including Airbus, Boeing, Spirit Aerosystems and Labinal.

National Defence Industry Council being established

To provide support for the local defence industry, a National Defence Industry Council is being established. Formally launched in March 2012, this body is in the early stages of being formed. Defence and Military Veterans Minister Nosiviwe Mapisa-Nqakula has noted: "The launching of the council will usher [in] a new dispensation for the management of our relations with the defence industry and also allow for direct support in this regard." The council is intended to provide close coordination between the country's defence companies, research agencies and the South African National Defence Force.

Source: *Engineering News*

DCD Protected Mobility, part of the DCD industrial and engineering group, manufactures mine-protected and armoured vehicles. The company currently has a product range of several types of vehicle – the Husky and the Husky 2G, the Springbuck, the Ikri, the Mountain Lion, the Testudo and the Oribi.

In early 2015, DCD Protected Mobility sold its manufacturing plant, in Isando, Gauteng, to the Paramount Group, which will also use the facility to build mine-protected and armoured vehicles. DCD Protected Mobility has resumed manufacturing its products at the DCD Group's Boksburg plant, alongside its rolling stock manufacturing facility. The company has not sold any of its intellectual property to Paramount, and remains the OEM of all its products.

However, included in the Paramount agreement was the transfer of about 100 staff to the Paramount Group. DCD Protected Mobility has noted that the deal with Paramount does not mark any change in the DCD Group's strategy for its Protected Mobility business.

Further, the company has indicated that it does not regard Paramount as a competitor. GM Cornelius Grundling has stated: "Our products are unique in the land mobility role and application. Our success is based on technical expertise and a track record of excellent quality, as well as cost and schedule compliance on all contracts."

OTT Technologies designs, develops and manufactures armoured and mine-protected vehicles. It



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DCD's Mountain Lion mine-protected and armoured vehicle

Picture by Duane Daws

also refurbishes military vehicles for the police and, military, as well as for peacekeeping, and security-related clients. Further, the company supplies new and refurbished original spares for a wide range of defence-related vehicles.

The **Paramount Group** is the largest privately owned defence and aerospace company in Africa. The company's market sectors are defence, internal security, peacekeeping and correctional services, and it operates in four broad areas: land, aerospace, maritime and electronic systems.

Paramount Group Land Systems offers armoured and mine protected vehicles, camp systems, communications, force protection and logistics support. The company's armoured-vehicle range currently comprises the Matador and Marauder mine-protected vehicles, the Maverick internal security vehicle, the Mbombe 6 × 6 armoured fighting vehicle and the Marauder Patrol, a light reconnaissance and

patrol vehicle. In early 2015, Paramount acquired the manufacturing facilities and certain other assets of DCD Protected Mobility. Included in the deal was an agreement to transfer about 100 staff from DCD to the Paramount Group. The newly acquired plant will initially be used to manufacture Mbombe infantry fighting vehicles for Jordan.

Paramount Aerospace offers a range of solutions, including supersonic fighter aircraft, advanced high-performance reconnaissance light aircraft, air force establishment and an academy for pilot training.

In 2014, Paramount acquired 100% of Aerosud's military business and it continues to hold a major stake in Aerosud Holdings, which designs, develops and manufactures parts, components and fittings for Airbus, Boeing and other aircraft manufacturers. Paramount previously acquired another local aerospace and defence company, Advanced Technologies & Engineering, or ATE.

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With regard to naval capabilities, Paramount can offer a broad spectrum of marine and naval-related expertise. The company uses a number of dockyards for the upgrading and refitting of marine craft, and can also provide new vessels, including light-strike craft, rapid intervention vessels, coastal and river patrol vessels. It can also integrate specialised weapon and surveillance systems in this field. In 2014, Paramount shipbuilding subsidiary Nautic acquired another shipbuilder, Veecraft.

As a result, Paramount can cater for navy vessels ranging in length from 8 m to 100 m. Together, Nautic and Veecraft have an order book of about R1-billion and yearly revenues of about R500-million.

Paramount Electronic Systems strengthens land, air and maritime force capabilities by integrating self-supporting mission command and control electronics. The solutions include communications and signals technologies deployed in electronic counter-measure and intelligence applications. Paramount operates as an integrator and is not aligned to any manufacturer.

The Paramount Group considers robotics as a key area for future military technological development. Its existing expertise in UAVs has been expanded into the naval sector, with Nautic working on an unmanned surface vessel. Further, the same is being done regarding land systems, although this is more complicated.

Paramount is based in South Africa, but has developed a portable manufacturing model that enables a transfer of technology and skills and the creation of local job opportunities in the buying country.

Reutech, a subsidiary of JSE-listed Reunert, develops and supplies defence-related products. The company has four divisions active in the defence industry – Reutech Radar Systems, Reutech Communications, Reutech Solutions and Fuchs Electronics. Reutech Radar Systems designs, develops and manufactures military radar and mining radar and has more recently diversified into tracking systems for concentrated photovoltaic plants. An estimated 40% of its revenues are derived from its military business and 60% from its civil business. Reutech Communications, which in 2014 successfully expanded its product offering into South-East Asia and opened pathways for other Reutech

companies to introduce their product offerings in future, specialises in secure military communication systems for airborne, land- and naval-based applications. Reutech Solutions supplies turnkey solutions for, among other aspects, weapon-stabilisation and fire-detecting systems. Fuchs Electronics has capabilities that include electronic and precision mechanical design and the high-volume production of electromechanical assemblies.

In 2014, Reutech recorded revenue of R1-billion, which was almost evenly split between local and export markets. The company's profit for the year was R170-million, which was an 18% decline on the previous year, owing to a lack of orders for Fuchs Electronics.

In recent years, Reutech has focused on diversifying its revenue streams and, as a result, has become active in various sectors outside of the defence market, including mining, renewable energy and information communication technology.

Saab South Africa is part of the Swedish technology group Saab, with Saab Grintek Defence forming the major component of Saab South Africa's operations. Saab Grintek Defence specialises in areas that include EW systems, sensor technology, command and control, training systems, avionics, security and support solutions. The company has reported receiving a lot of interest worldwide in the latest version of its armoured vehicle Land Electronics Defence System, the Mark 2. The system is a so-called "soft-kill" system, as it confuses, distracts, blocks and/or jams surveillance, targeting and weapons systems. Almost 75% of Saab Grintek Defence's turnover is from the export market.

In May 2015, a deal was announced in terms of which African Equity Empowerment Investments (AEEI) would acquire 25% plus one share of Saab Grintek Defence for R120-million. Another component of the deal would result in AEEI selling its 5% shareholding in Saab South Africa for R20-million. The deal was expected to be concluded in June 2015.

Tellumat Defence is a division of electronic technology company Tellumat. The division, which serves international aerospace, landward and maritime markets, has five broad areas of business – identification solutions, radar solutions, tactical data links, automated and airport systems, and ground-based air navigation.



Defence innovation

South Africa's defence industry has high-level scientific, engineering, technological and technical skills, and can offer advanced design, development and manufacturing processes. As a result, the industry has been at the forefront of many significant defence developments.

Denel group CEO Riaz Saloojee, when announcing the company's financial results for the 2013/14 financial year, stated: "We are fully aware . . . that the company's future growth will be largely dependent on our ability to remain competitive in a global high-technology environment. We are committed to increasing investments in future capabilities and technologies, fostering innovation and expanding the company's product offerings."

Various Denel divisions are involved in innovative product-related developments.

Engineering News reported in March 2015 that Denel Dynamics had three development projects – the A-Darter, the Seeker 400 unmanned aerial vehicle and the Umbani precision-guided bomb kit – which were coming to an end and being transformed into industrialisation and production programmes for local and foreign customers. The A-Darter is an infrared homing air-to-air missile, conceived by Denel Dynamics but jointly developed with Brazil. Development of the missile has been completed, and development guided tests have proven the performance of the missile. Production lines will be established in both countries involved in the development of the A-Darter, with production expected to start before the end of 2015. Denel has stated that the A-Darter will be a global leader in its class when it comes into service. The Seeker 400, a large tactical unmanned aerial vehicle (UAV),



Denel Dynamics' A-Darter infrared homing air-to-air missile

Picture by Duane Daws

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has been through a range of performance evaluation tests and has performed well against specifications. The Seeker 400 has entered production for its initial overseas customer, and Denel has been engaged in discussions with other potential customers.

As Denel Dynamics' latest projects become production programmes, new development projects are taking their place. A major new project is the Marlin. This will be a beyond-visual-range radar homing missile, with more than one application. The Marlin, which is in the technology demonstration phase, is intended for air-to-air, ground-to-air and naval surface-to-air activities. Although intended to fulfil the requirements of the South African National Defence Force, it has attracted overseas interest. Denel Dynamics plans to increase its revenue to more than R2-billion within five years. In the 2014/15 financial year, the division achieved revenues of R1.49-billion.

Rheinmetall Denel Munition (RDM) reported in October 2014 that it was launching new products onto the international market. It announced having a completely new 155 mm artillery ammunition range, called Assegai. The company also indicated that its range of 76/62 mm shells used by naval guns was being upgraded to the latest international insensitive munitions standards. Insensitive munitions are almost incapable of being detonated accidentally – in the event of a serious fire, for example – if they are not fused and armed.

The company has also developed insensitive munitions for aircraft bombs, and it now produces Mark 81 and Mark 82 bombs with such munitions. RDM has also developed new suites of 60 mm and 81 mm mortar bombs, to be qualified to North Atlantic Treaty Organisation standards. The company has also been very active in the realm of 40 mm grenades for firing from grenade launchers. Further, it is developing new nonlethal rounds for police forces to replace plastic bullets, birdshot and baton rounds for riot control operations. Although these latter types of ammunition are usually nonlethal, the company's new rounds are even less lethal, while still being effective against violent protestors. RDM is spending about R50-million a year on research and development (R&D).

Denel Aerostructures and Denel Aviation indicated towards the end of 2014 that they were jointly involved in a major new project – the South African Regional Aircraft (Sara). The project is currently in its pre-development phase, expected to span about 18 months.



Land Systems South Africa's RG21 4x4 mine-protected vehicle

Picture by Keith Campbell

This will be followed by a five-year development phase, with a prototype aircraft expected by 2020 or 2021. Currently, three versions of the Sara are planned – an airliner version, carrying 24 passengers; a combi version, carrying 12 passengers and one LD2 cargo pallet; and a freight version, able to transport three LD2 pallets. While the project is a Denel initiative, the group is actively seeking support from other players in government and industry, as well as research institutions, to support or participate in the project.

Meanwhile, the partnership between the recently established Denel Integrated Systems & Management (DISM) and GEW Technologies, to pursue future electronic warfare (EW) programmes, is expected to play a leadership role in coordinating different initiatives in the EW field. DISM CEO Ismail Dockrat has noted that “EW will be a primary focus area for the South African National Defence Force to rapidly expand its current capabilities and implement counter-measures to combat potential threats to the security of the country”. The Defence Review also identifies EW as a “key technology domain” in which South Africa needs to maintain a “sovereign capability” vested in local companies.

Land Systems South Africa has launched the new RG21 4x4 mine-protected vehicle. The company has described the vehicle as being about “affordability,



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Paramount's AHRLAC

Picture by Sashnee Moddley

supportability and protection. We saw a gap in the market. MRAP [mine-resistant ambush-protected] vehicles are often big and heavy. This is lighter (it weighs 14 t) with a less aggressive appearance, useful in peacekeeping. Unlike our other vehicles, it does not have a monocoque hull. It is based on a full Iveco truck chassis". The RG21 will cost less than half the price of a standard 4x4 MRAP. Using Iveco chassis means that specialised support for the vehicle will not be needed. The global Iveco network can be used instead. The RG21 will come in armoured personnel carrier, ambulance and command versions. Despite its affordability, the vehicle still enjoys high levels of protection. It has been successfully landmine blast-tested.

In addition to the innovations being introduced to the market by Denel, several other South African defence companies and research organisations have released new products and are working on new defence products and technologies.

Specialist mine-detection and mine-protected vehicle company DCD Protected Mobility recently unveiled the Oribi multirole utility truck, which was jointly developed with vehicle-customising enterprise Histomart.

The vehicle can operate on rails, tar roads and in severe off-road conditions, making it suitable for numerous industries, including military and security, as well as agriculture, construction and mining. For operations in the bush, it is fitted with bull bars, engine and transmission sump guards, a fuel-tank shield, headlight covers, window protection and a snorkel allowing fording to a depth of 900 mm.

DCD Protected Mobility has also recently launched the Testudo unmanned ground vehicle, designed for civil and military operations such as explosives disposal, reconnaissance, mine surveying and search and rescue.

Defence and aerospace company Paramount Group is preparing to industrialise its Advanced High-Performance Reconnaissance Light Aircraft (AHRLAC), including the construction of a factory and a new runway, as global interest in the aircraft continues to grow. The AHRLAC is the first military-manned fixed-wing aircraft to be fully designed, tested and developed in Africa. From its first flight in July 2014, until February 2015, the prototype aircraft completed 65 hours of incident-free test flying. Paramount contends that the aircraft meets a key industry need by performing the combined tasks that previously required four separately configured aircraft. It integrates designs from surveillance platforms and reconnaissance aircraft with the ability to carry surveillance, weapons, radar and electronic warfare systems. This has resulted in advanced operational solutions, historically requiring more costly aircraft or complex unmanned aerial surveillance systems. The aircraft was designed and built by a team of 60 engineers and technicians, with 98% of the 6 000 parts of the airframe locally designed and produced.

Meanwhile, Paramount has established a dedicated robotics business, Paramount Robotics Systems, and has assigned more than R100-million for R&D in the new robotics unit. The robotics unit is a consolidation of Paramount's mission systems, unmanned and robotics capabilities across land, sea and air. The company considers robotics as a key area of future

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Skills development in the defence industry

Recognising the risk to South Africa's economy posed by skills shortages, companies in the defence industry are involved in skills development initiatives.

For example, in the 2014 financial year, Denel spent R64-million on skills development. This spending was allocated to the company's 'Talent Pipeline Model', which starts with maths and science programmes for high school learners and continues to bursaries for tertiary studies, internships and mentoring programmes.

As part of its skills development plans, Denel Aviation signed a memorandum of understanding (MoU) in September 2014 with one of the world's top simulation and training companies, Canada's CAE, and its local partner, Elisa. The aim of the MoU is to establish a National Training and Simulation Centre (NTSC). The planned NTSC will be located at the Denel Training Academy, which falls under Denel Aviation. It is scheduled to be fully operational by 2020, although it is likely to be functional somewhat earlier, in 2018 or 2019. It will include a six-axis full flight simulator, other flying training devices with lesser degrees of fidelity and a number of technical training systems.

Private-sector defence companies are also involved in skills development. Paramount Group, for example, indicated in February 2015 that it would establish a multimillion-rand high-technical-skills development programme to advance the South African defence industry and enable the group to meet its future growth plans. Young descendants of military veterans will work with Paramount Group employees, through a programme of bursaries for tertiary education placements and on-the-job apprenticeships, to ensure the group's knowledge and skills are passed on to the next generation of South Africans.

Paramount Group's skills development programme was established in response to a need to ensure the defence industry's sustainability by creating an opportunity for the industry to transfer core skills to the next generation.

Source: *Engineering News*, Defence Web

military technological development, and chairperson Ivor Ichikowitz has stated: "The next generation of innovation in the global defence and security sector will be in the robotics sector. As warfare becomes more complex and the political risk associated with loss of life becomes more sensitive, both sophisticated and developing defence forces alike are investing in reducing the number of soldiers exposed to dangerous environments." Paramount believes that it has the potential to be the robotics leader in South Africa. South Africa's Council for Scientific and Industrial Research (CSIR) has announced that it is partnering with local company Space Commercial Services Holdings Aerospace group to develop a maritime wide-area synthetic aperture radar (SAR) for use by small satellites.

The South African-developed small satellite SAR will enable global stakeholders and partners to have strategic independence through full access and control to the data and information products. This type of radar is unique in that it provides all-weather strategic information, day and night, for maritime surveillance, reconnaissance, resource and disaster management.

The new SAR is intended to be lightweight and cost-effective while delivering high-value imagery.

The CSIR has also entered into an agreement with Algeria's University of Blinda to establish a Joint Centre of Excellence (JCoE) for aeronautics research. The agreement comprises a memorandum of understanding, signed at the November 2014 International Exhibition of Unmanned Aerial Vehicles, in Algeria. The South African Department of Science and Technology and the Algerian Ministry of Higher Education and Scientific Research are facilitating the JCoE.

The initiative will broaden the bilateral science and technology cooperation agreement between the two countries. Areas of possible cooperation include aeroelasticity, aeronautics, aircraft structures, avionics and ground systems, computational methods, flow control, gas turbines, hypersonic flow, optronics, radar, space technologies, stores integration, UAV technologies and wind tunnels. The JCoE will incorporate knowledge transfer through staff exchanges, joint seminars and workshops, postgraduate student programmes and joint development programmes.

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Local demand

South Africa currently spends about 1.2% of gross domestic product (GDP) on defence. This level of spending is widely considered to be inadequate, with the Defence Review indicating that the defence force is nearly 24% underfunded.

The Institute for Security Studies (ISS) contends that, as a general rule, developing countries should spend about 2% of GDP on defence, but that “as a middle-income regional leader, South Africa’s defence expenditure should be compared with that of regional leaders elsewhere”. The institute explains that regional leaders are expected to provide more in terms of defence capabilities than others.

The Defence Review recommended increasing defence expenditure to 1.6% of GDP in 2015, 2% in 2016 and 2.4% in 2017, and proposed that such expenditure should increase at an average of 6.8% a year from 2017 to 2028. However, as yet, there is no sign that there will be a meaningful increase.

Meanwhile, there are piecemeal efforts under way to acquire certain new pieces of equipment to enhance South Africa’s defence capabilities, with the focus of defence spending on peacekeeping operations, border security and equipment modernisation requirements.

The South African Army is getting new Badger infantry fighting vehicles to replace its Ratel infantry fighting vehicles, through an initiative known as Project Hoefyster. The Badger’s platform is based on a design from Finnish company Patria, which has been modified by Denel Land Systems to meet local user requirements, including landmine protection, manoeuvrability and firepower.

A multibillion-rand order has been placed for 238 vehicles, compared with 264 vehicles that were originally expected to be ordered. The decrease was linked to funding limitations. The fleet of Badgers is expected to be delivered over ten years, starting in 2016.

Projects to acquire new armoured personnel carriers (Project Sepula) and new cross-country trucks (Project Vistula) have been conceptualised, but have not yet been implemented.

The South African Navy is set to get new patrol vessels under Project Biro. The project includes the acquisition of three offshore patrol vessels and three inshore patrol vessels, with the first of these vessels expected to be delivered in 2018. The project has attracted interest from shipyards worldwide, but the platforms will be built locally, possibly by a joint venture between local and international shipbuilders.

The South African Navy is also set to get a new hydrographic vessel under Project Hotel. Further, the tender for this project requires that the successful bidder supply a pair of inshore survey motorboats, integrated with the hydrographic vessel; and a sea boat and a hangar-flight deck arrangement for a medium-sized maritime helicopter. Representatives from 12 shipyards attended a bidders conference for interested parties in October 2014. In April 2015, the tender submission date for Project Hotel was extended by two months, from the original submission date of April 24, to allow bidders to finalise their submissions. This announcement was followed in May 2015 by an announcement that the 25% mandatory black economic-empowerment requirement had been removed from the tender documents.

Meanwhile, South Africa continues to import a large portion of its defence equipment requirements. Government has guidelines that require that government and parastatal purchases or lease contracts with high levels of imported content include a National Industrial Participation, or offset, component. In addition, defence contracts require a Defence Industrial Participation component. Industrial participation programmes are fairly common in the global defence industry, as they offset the expense of unusually large arms deals by requiring a percentage of the contract value to be invested in the economy of the buying country.



Export demand and international collaboration

South Africa's defence industry, while small by international standards, has an excellent reputation in the global market, with the bulk of local defence production being exported. South African aerospace and defence products – ranging from complete systems, subsystems and major components to parts – can be found in service on virtually every continent.

Despite the Defence Review, local defence spending remains low, and there is no sign yet that there will be any meaningful improvement.

This means that the main focus of the local defence industry remains exports.

However, as more countries seek to develop their own aerospace, defence and maritime industries, the global market is becoming ever more competitive. In response, local companies are increasingly collaborating with each other and international partners to maintain their position in the global market.

According to the National Conventional Arms Control Committee, almost R3-billion worth of arms were exported from South Africa in 2014, which was similar to the R3.2-billion export figure recorded for the previous year. The bulk of the exports, by value, comprised 326 armoured vehicles, delivered various of countries, and four mine detection vehicles, delivered to Iraq. Seven cannons were delivered to Indonesia, 11 turrets were delivered to Malaysia, four artillery systems were sold to Saudi Arabia, six gun/howitzers were sent to the United Arab Emirates, four missiles were sold to Germany and five antimaterial rifles were sold to Azerbaijan.

Exports also included smaller weapons and ammunition, as well as self defence suits and electronic warfare equipment, transponders, radio equipment, transceivers, laser range finders, sights, a submarine periscope, binoculars, airborne observation systems and software.

Some of the recent export and international partnership activities of companies active in South Africa's defence industry are detailed below.

Denel has noted that about half of its revenues are derived from its international business. The company has partnership agreements with several international customers.

In March 2015, Denel Aerostructures signed a memorandum of understanding (MoU) with Strand Aerospace Malaysia covering knowledge transfer and possible subcontracting opportunities.

Denel Dynamics has reported that there has been international interest in its A-Darter missile, jointly developed by South Africa and Brazil, and has noted that the launch customer for the Seeker 400 unmanned aerial vehicle (UAV) is an overseas client.

Denel Mechem is engaged in several new demining contracts in Kuwait and the Democratic Republic of Congo, and has been awarded a three-year United Nations (UN) contract in Abyei, a contested region between Sudan and South Sudan. It is also active in demining activities in Angola and Mozambique. Further, Denel Mechem is continuing to expand its involvement in the field camp business, with new contracts from the UN, in Somalia. The company has also received two three-year training contracts from the UN to train its troop-contributing countries in explosive ordnance disposal and vehicle operation.

Rheinmetall Denel Munition (RDM), which is 49% owned by Denel and 51% owned by Germany's Rheinmetall, is very active in the export market. For example, RDM has received orders from North Atlantic Treaty Organisation and Middle Eastern countries for its new 155 mm Assegai range of artillery rounds. Further, the company has an order for 35 000 rounds of 105 mm preformed fragmentation artillery shells from the US, while on the mortar front, RDM is delivering to a Middle

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Eastern customer and expects further orders from this client. The company is the sole supplier of propellants for Belgian company Forges de Zeebrugge's FZ 70 rockets, and has noted that any future rockets developed by the Belgian company are likely to have RDM propellants. With regard to smaller ammunition, RDM's 40/51 mm medium-velocity grenade ammunition has several international customers, including in the Asia Pacific region, Latin America and the Middle East. RDM also has a partnership with Indonesian State-owned company PT Pindad, with the two companies having signed a teaming agreement in September 2014. The agreement will facilitate cooperation between the two companies pertaining to several product groups and training requirements.

Denel's Overberg Test Range (OTR), while being based in South Africa, has several international clients, with about 42% of its turnover coming from foreign customers. The company is considering expanding its international client list, and is targeting ministries of defence that are either developing weapons or lack the space or environment to test weapons in their own countries. OTR can assist international customers with import and export permits and logistics, and can arrange for subcontractor assistance.

Currently, Germany is a major customer for OTR, with the German air force and navy using the facility, along with a number of defence companies. Another large and regular foreign customer of OTR is the Republic of Singapore Air Force, which uses OTR to conduct air defence exercises involving the firing of various missiles. Other international clients include Saab, the Italian air force, BAE Systems, ST Aerospace, Aero Vodochody, the Turkish navy and Spanish air force.

Export activity is also strong outside the Denel stable.

In 2014, DCD Protected Mobility launched a new type of mine-protected patrol vehicle, which will be built for the Nigeria Police Force's (NPF's) paramilitary units. Named after a mythical Nigerian creature, the Ikri patrol vehicle was developed by DCD and its Nigeria-based partner, Mekahog, in close cooperation with the NPF. The vehicle is based on DCD's Springbuck protected all-terrain armoured personnel carrier, which has been in service with the NPF since 2006. DCD and Mekahog will establish a military vehicle maintenance and repair facility in Nigeria, and once the facility is established, the local assembly of Ikri kits and complete vehicles will

begin. Compared with the basic Springbuck unit, the Ikri offers better protection, mobility and crew comfort.

DCD's presence in Nigeria follows several successful export contracts elsewhere in the world. The company's Husky vehicle, for example, has been exported to Australia, Canada, France, Iraq, Kenya, Spain, Turkey, Uganda, the UK and the US. The US is by far the biggest customer for this vehicle.

In mid-2014, Paramount signed a memorandum of collaboration with major US company Boeing Defence, Space and Security. In terms of the memorandum, the two companies will jointly work on opportunities in the defence and security sectors in important international markets. Such opportunities exist regarding border security, coastal piracy and antipoaching, disaster and humanitarian relief and heavy airlift over long ranges. With regard to platforms, the collaboration could include UAVs and their support, different types of Boeing rotorcraft and Paramount land vehicles and aerospace systems.

In early 2015, Paramount concluded a deal with Jordan's State-owned defence company King Abdullah II Design and Development Bureau to manufacture 50 6×6 Mbombe infantry combat vehicles in Jordan and South Africa. The signing of the contract followed extensive vehicle trials in 50 °C desert conditions in Jordan and the United Arab Emirates, as well as in -50 °C winter conditions in Kazakhstan. The Mbombe successfully completed the rigorous trials and covered more than 10 000 km in harsh and challenging environments. The vehicle will become the platform for the future 6 × 6 requirements of the Jordanian Armed Forces.

Also in early 2015, Paramount signed an MoU with Motor Sich JSX of the Ukraine to collaborate on the production and modernisation of helicopters and aviation engineering components. The MoU commits the two companies to exploring the opportunity of transferring technologies relating to rotary platforms. In late 2014, Paramount signed a collaboration agreement with Turkish defence company Aselsan, which produces tactical military radios and defence electronic systems for the Turkish Armed Forces.

Meanwhile, Paramount is also preparing to industrialise its Advanced High-Performance Reconnaissance Light Aircraft, including the construction of a factory and a new runway, as global interest in the aircraft continues



to grow, with a number of air forces in the Middle East and elsewhere evaluating the aircraft.

Reutech Radar Systems is exploring new markets for its defence business, including in the Middle East and the Far East. Saab Grintek Defence has a yearly turnover of more than R1-billion, with between 80% and 90% of this being export orders. A key source of

income for the company is its integrated self-protection systems. A major client for these systems is the Indian Army and Air Force, which have fitted the components to their advanced light helicopters. Saab Grintek Defence is also responsible for producing some of the microwave modules for the antennas and electronic warfare components of the Gripen fighter jet for the international market.

The global defence market

The Stockholm International Peace Research Institute (Sipri) indicates that world military expenditure reached \$1.78-trillion in 2014.

Spending for the year continued to increase rapidly in Africa, Eastern Europe and the Middle East, driven by a combination of high oil prices (until the end of 2014) and regional conflicts. The conflicts in Ukraine, Iraq and Syria could continue to drive defence spending, although the dramatic decline in the oil price towards the end of 2014 could shift the trend in countries that are highly dependent on oil revenues.

Military spending also increased in the Asia/Oceania region in 2014, largely as a result of increased Chinese military expenditure. In Latin America and the Caribbean, 2014 military expenditure was largely unchanged from 2013, although Brazil reduced its spending, owing to economic challenges. The fight against drug cartels in Central America remains a key driver of military spending in that subregion.

World military spending 2014

| Region | Spending (\$ b.) | Change (%) |
|-----------------------------------|------------------|------------|
| Africa | (50) | 5.9 |
| North Africa | 20.1 | 7.6 |
| Sub-Saharan Africa | (30.1) | 4.8 |
| Americas | 705 | -5.7 |
| Central America and the Caribbean | 10.4 | 9.1 |
| North America | 627 | -6.4 |
| South America | 67.3 | -1.3 |
| Asia and Oceania | 439 | 5.0 |
| Central and South Asia | 65.9 | 2.0 |
| East Asia | 309 | 6.2 |
| Oceania | 28.0 | 6.9 |
| South East Asia | 35.9 | -0.4 |
| Europe | 386 | 0.6 |
| Eastern Europe | 93.9 | 8.4 |
| Western and Central | 292 | -1.9 |
| Middle East | (196) | 5.2 |
| World total | 1776 | -0.4 |

() = uncertain estimate. Spending figures are in current (2014) US\$. All changes are in real terms



Armoured fighting vehicles

Picture by Crow (Flickr)

Source: Stockholm International Peace Research Institute, Yearbook 2014

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International arms transfers

Since 1950, the US and Russia have consistently been the largest arms suppliers in the world. More recently, China has established itself as one of the top five arms suppliers in the world, narrowly surpassing Germany and France from 2010 to 2014. The top five arms importers from 2010 to 2014 were India, Saudi Arabia, China, the United Arab Emirates and Pakistan. Saudi Arabia has recorded a significant increase in imports, and its rise to second position is noteworthy. Together with several other Arab States of the Gulf, Saudi Arabia has placed substantial arms orders in recent years. Deliveries of those orders have only just started and thus further growth in the region's imports is expected.

Arms supplies to countries involved in armed conflict and to non-State forces became a significant issue in 2014. Suppliers had to make decisions on transfers to Iraq and other States involved in the war against the Islamic State, including supplies to militias not fully under the control of the central Iraqi government. The conflict in Ukraine also led to discussions among Western countries on issues regarding the supply of arms to the Ukrainian government.

The main importers and exporters of major arms, 2010–14

| Exporter | Global share (%) | Importer | Global share (%) |
|------------|------------------|-----------------|------------------|
| 1. US | 31 | 1. India | 15 |
| 2. Russia | 27 | 2. Saudi Arabia | 5 |
| 3. China | 5 | 3. China | 5 |
| 4. Germany | 5 | 4. UAE | 4 |
| 5. France | 5 | 5. Pakistan | 4 |
| 6. UK | 4 | 6. Australia | 4 |
| 7. Spain | 3 | 7. Turkey | 3 |
| 8. Italy | 3 | 8. US | 3 |
| 9. Ukraine | 3 | 9. South Korea | 3 |
| 10. Israel | 2 | 10. Singapore | 3 |

Stockholm International Peace Research Institute



Picture by Israel Defense Force

Source: Stockholm International Peace Research Institute, Yearbook 2014

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Diversification

Globally, there exists a two-way relationship between defence and nondefence companies, with nondefence companies increasingly supplying civilian technologies for use in defence products, while many companies involved in defence production are diversifying into civilian activities.

South Africa's largest defence company, Denel, is actively diversifying beyond the defence and aerospace sectors. Speaking at the announcement of the company's 2014 results, group CEO Riaz Saloojee explained that "Denel is growing from being a predominantly defence company into a broader technology clearing-house that can use the skills, knowledge and expertise we have accumulated in the defence arena to add value to high-tech engineering and manufacturing programmes to revitalise the country's infrastructure".

Obvious areas of diversification for Denel are the civil security and commercial aviation sectors, and Denel is pursuing opportunities in this regard. However, the company is also pursuing various other diversification options. For example, the company has indicated an interest in participating in the railway upgrade programmes being pursued by transport utility Transnet and the Passenger Rail Agency of South Africa.

Denel has also diversified into the space domain, with the establishment of Spaceteq, a space engineering business unit, which is involved in the development of an earth observation satellite for use by the South African National Space Agency.

The satellite will be used in the areas of food security, urban planning and development, safety and security and as support for disaster management.

Denel Aviation is providing shore-to-ship helicopter services for Transnet in Durban and Richards Bay, in KwaZulu-Natal, as well as maintaining the helicopters involved.

Meanwhile, Denel Mechem is receiving orders from commercial enterprises for its field camp services. For example, Mechem has supplied camps to petrochemicals company Sasol, in Mozambique, where it works on a gas pipeline.

Newly established Denel Integrated Systems and Management (DISM) has identified the national and civil security sectors as one of its main market areas.

The business unit has engaged in discussions with various agencies, such as the Border Management Agency, the South African Police Service and the State Security Agency, regarding civil security. It has also met with the National Disaster Management Centre. In March 2015, DISM reported that it had entered into a partnership with Aviation Coordination Services to provide secure hold baggage screening services at African airports (outside South Africa). DISM views the agreement as an opportunity to start playing a role in the security arena on the broader continent.

Armcor is also diversifying. For example, its Gerotek facility has expanded beyond its role of being a testing ground for military vehicles, and now offers accredited test and evaluation, product promotion, corporate events, advanced driver training and driver development services. The driver training services offered by Gerotek include courses in highjack prevention, defensive driving and offroad driving, as well as a course tailored for the drivers of minibus taxis.

Aside from the State-owned operators, other participants active in the defence sector are also pursuing diversification opportunities.

For example, Reutech Radar Systems has used its expertise in designing radar to expand into the mining sector, and has, more recently, diversified into tracking systems for concentrated photovoltaic plants. An estimated 40% of the company's revenues come from its military business and 60% from its civil business.

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Saab's South African division, Saab Grintek Defence, is primarily focused on defence, particularly electronic warfare and self-protection. However, the company also offers products and services to the civil security and private markets. In late 2014, it announced that it had received an order for a mobile medical system

for Anglo American's Kumba Iron Ore business unit, in the Northern Cape. The company described the order as "an important breakthrough for Saab in the private mining sector in the sub-Saharan region". The contract requires the design, manufacture, supply and delivery of mobile medical systems to Kumba's Sishen mine.



Many nondefence companies are increasingly supplying civilian technologies for use in defence products

Picture by Duane Daws

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Outlook

Until it becomes apparent that local defence spending is increasing, the focus of the local industry will remain the export market. However, in a world in which an increasing number of countries are seeking to develop their own aerospace, defence and maritime industries, the global market is becoming ever more competitive.

The defence industry has noted that the response to this is for local companies to collaborate with each other and with international partners. Denel Land Systems (DLS) CEO Stephan Burger has stated: "If this [collaboration] is not part of your business plan, the sustainability of your business is in doubt." He cites the example of the new Badger infantry fighting vehicle being acquired by the South African Army under Project Hoefyster. Although DLS is the prime contractor, the technology for the vehicle, for example, comes from international partner Patria, and the gun drive comes from another international partner, Curtiss Wright.

"We regard ourselves as an industry leader and we can do that through partnerships and trusted relationships," states Burger. "The Badger consists of about 5 000 replaceable items. We manufacture eight at Denel Land Systems".

Similarly, Armscor has noted the importance of collaborations and partnerships in sharing research and development costs, manufacturing costs and even markets. The organisation has also emphasised that defence-related partnerships should include other African countries. It has been noted that African countries should cooperate more in defence, including defence technology and the defence industry, to strengthen the continent's sovereignty.

Denel Aerostructures (DAe) CEO Ismail Dockrat has pointed out that the local industry is already integrated

into the global aerospace industry original-equipment manufacturer (OEM) supply chains. These include Agusta Westland, the Airbus group, Alenia Aeronautica, BAE Systems, Boeing, Dassault, Gulfstream (part of General Dynamics), Lockheed Martin, Rolls-Royce, Saab and Safran. DAe, for example, is heavily involved in the Airbus Defence and Space A400M military airlift aircraft programme, manufacturing major and smaller components.

Consequently, the South African aerospace industry could serve as the foundation for the growth of the African aerospace industry. However, in addition to supporting overseas OEMs, the local industry should also have its own aircraft project to maintain local OEM design, development and manufacturing skills, developed through the Rooivalk attack helicopter programme.

This will further strengthen the local sector and make it an even more desirable international partner. DAe and sister company Denel Aviation have proposed the South African Regional Aircraft project as such a programme.

DCD Protected Mobility GM Andre Mears has also cited partnerships as a basis for success. "We are a global leader in the design, manufacture and support of special-purpose tactical wheeled vehicles. We see our business as assured mobility or, more particularly, route clearance – [clearing land mines and improvised explosive devices]," he explains. "With our local and international partners we have become world leaders in route clearance. We have created very valuable partnerships and friendships, especially in the US."

Another trend, although less prominent but evident worldwide in the defence industry, is consolidation.



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