

The Aerospace Industry: Prospects for Strategic Cooperation Among the IBSA Countries

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1. Introduction

This report constitutes the final of three project segments undertaken as part of a collaborative research project – “South-South Trade and Investment Cooperation: Exploring the IBSA Initiative” – involving the South African Institute of International Affairs (SAIIA), the Centre for International Trade, Economics and Environment (CUTS-CITEE) and the Brazilian Institute of International Trade Negotiations (ICONE). Initiated in February 2005, the project seeks to identify barriers that impede trade and investment flows between the India, Brazil and South Africa – the IBSA countries – and to examine ways in which these can be reduced or eliminated.

The first segment of the project carried out a perception survey aimed at gleaning the perceptions of representatives of thirty South African companies about the Brazilian and Indian commercial environments, while the second discussed the negotiations to create a preferential trade agreement between the Southern African Customs Union (South Africa, Botswana, Lesotho, Swaziland and Namibia) and India.

This report explores strategies that can be employed to strengthen strategic cooperation among the IBSA countries in the aerospace sector. It is based on exhaustive interviews conducted by the author with representatives of five South African aerospace and defence firms during the period September-November 2005. These are the state-owned Denel, Aerosud, Reutech, Grintek and African Defence Systems. Statistical information about these companies – including the numbers of people they employ, annual sales, and annual exports and imports – is provided in appendix A. The interviews were informed by a semi-structured questionnaire designed by the research partners comprising of seven broad areas (see appendix C).

The report is made up of five sections. First, it contextualises the discussion by explaining the dynamics of the global aerospace industry. Departing from the position that the current state and future of the South African aerospace industry cannot be appreciated fully without comprehending the nature of the broader South African defence-related industries, the second part describes the history, ownership structure and capabilities of the country’s defence-related industries. Flowing from this, the next section zooms in on the aerospace sector in specific and comprehensive detail. Fourth, the report outlines the central research findings from the interviews that were held with participating aerospace and defence firms. The concluding part briefly spells out a proposal put forward during the research regarding how to take forward the ideas and insights contained in the report.

2. The global aerospace industry

Not only is the aerospace industry a strategic asset, it is an important generator of wealth and a driver of technological and economic development in many industrialised countries. It is a key source of employment; for example, in 2000 the European space industry directly employed 429 000 people, with thousands more employed indirectly.² The global aerospace sector is poised to expand by 25% in real terms over the next two decades to US\$250 billion per year, with the number of airlines in service expected to increase to 20 000 by 2020.³

In terms of technological complexity the aerospace sector is matched only by the space industry, and both industries produce the highest value-added items of all industries. The high levels of skills and technologies that underpin the aerospace sector render it a dynamic propeller of industrial innovation. These considerable skills and technologies also contribute to high quality

² Department of Trade and Industry, ‘A strategy for sustainable, economical and growing aerospace industry,’ 9 July, 2003.

³ See Peter Honey, ‘A new flight plan,’ *Financial Mail*, 14 October 2005.

and safety standards. Retaining these aerospace capacities, however, requires enormous amounts of research and development (R&D) spending.⁴

Yet the global aerospace industry remains heavily dominated by a few economic powers, with the United States (US) accounting for the lion's share of global market share and employment figures (see Table 1). It is a sector that is characterised by very stringent certification requirements and restrictive legislation, creating high barriers for aspirant emerging economies seeking to make significant inroads into the industry.

Table 1: Annual sales for select aerospace companies* - 2000

| Company | Country | Annual Sales (RB)* | Military Sales (RB)* | % Military |
|----------------|--------------|--------------------|----------------------|------------|
| Boeing | USA | 423 | 130 | 30% |
| Lockheed | USA | 235 | 188 | 80% |
| EADS | EU | 210 | 52 | 25% |
| BAE Systems | UK | 174 | 139 | 80% |
| Raytheon | USA | 156 | 125 | 80% |
| Northrop | USA | 79 | 56 | 70% |
| Thompson CSF | France | 62 | 43 | 70% |
| Finmeccanica | Italy | 35 | 17 | 50% |
| Denel Aviation | South Africa | 1.6 | 1.4 | 88% |
| SA Technical | South Africa | 2.2 | 0 | 0% |

Source: Hatty, 2000 (cited in DTI Assegai strategy, 2003)

The international aerospace industry can be divided into five categories (see appendix B). For the purpose of this report, these are broken into two broad categories: 'first-tier' and 'second-tier' suppliers. 'First-tier' contractors are those national states that are critical innovators at the edge of technological advance. Typically these are few big companies that provide wholly packaged systems to both commercial and military markets. Apart from selling the equipment, they maintain, upgrade and repair it throughout its lifespan. Nevertheless, the repair and conversion tasks have increasingly been outsourced to other industrial firms.⁵

They are fully-fledged business integrators, marketing, selling and delivering aircraft on a large scale in accordance with their contractual obligations. They are also system integrators, presiding over manufacturing contracts and management of supply chains, even though they do not necessarily undertake the manufacturing itself.

The 'second-tier' suppliers, on the other hand, are states that possess limited but significant aerospace capabilities. They include smaller industrialised countries such as Sweden, Canada and Australia, and emerging economies such as Brazil, India and South Africa. They supply either sub-systems consisting of several minor sub-systems, or parts and components. Their operations range from those that involve advanced system integration to those that focus on medium and low levels of system integration. Characteristically, companies that operate in this industry are required to meet strict certification conditions.⁶

Over the past years, the global aerospace industry has undergone a process of rationalisation and consolidation, driven mainly by company mergers and acquisitions. This has led to a decrease in the number of new aircraft development programmes, triggering stiff global competition among 'first-tier' business and system integrators. Similarly, growing competition among 'second tier'

⁴ Department of Trade and Industry, 'A strategy for sustainable, economical and growing aerospace industry,' 9 July 2003.

⁵ Ibid.

⁶ Ibid.

contractors has exerted pressures on the supply chain especially in respect of efficiencies, economies of scale and margins. This has prompted the system integrators to search for internationally competitive and pricing models.⁷

In their drive to retain competitiveness, the system integrators have sought to reconcile the imperative of increasing efficiencies with the necessity of reducing risk. Owing to the globalisation of the supply chain, the system integrators have been able to develop an extensive pool of sub-contractors across the world. In choosing working partners, key consideration has been given to countries that have cost-effective manufacturing solutions, balanced against the need to maintain acceptable production, quality and delivery standards.

3. The defence-related industries in South Africa

3.1. History

Although the origins of the South African defence-related industries date back to the 19th century, it was only in the 1960s that the erstwhile Nationalist Party government embarked on a concerted mission to significantly fortify South Africa's defence capabilities. This occurred within the context of South Africa's growing international ostracism as well as domestic and regional resistance induced by the country's apartheid policies.

Defence spending escalated following the imposition of an international arms embargo against South Africa in 1977, inspiring the apartheid regime's determined drive for strategic independence and self-sufficiency in armaments. As such, the 1980s saw defence production becoming one of the most important economic activities in South Africa, employing around 130 000 people and accounting for 9% of manufacturing jobs.⁸

This upward trend in defence expenditure was reversed following changes in South Africa's foreign strategic environment ushered by the end of the Cold War in the early 1990s. The defence budget shrank by over 50% in real terms between 1989/90 and 1997/98, with the acquisition budget decreasing by over 80% in real terms during the same period.⁹ The radical decline in defence spending had a huge effect on domestic defence-related industries, leading to the downsizing, rationalisation and closure of some defence companies.

The globalisation of the defence industry has prompted a strategic and structural review of the domestic defence sector. Forging international equity partnerships, joint ventures and strategic alliances with 'first-tier' contractors has been identified as pivotal to the long-term survival of the South African defence sector. South Africa, in particular, sees its future as that of playing a niche role in the region as a supplier and systems integrator of sub-systems and components to foreign weapon manufacturers. Already these working relationships have been established with companies in various countries, including the US, the United Kingdom, Germany, Malaysia, France, Italy, Sweden and Germany.

3.2. Ownership and structure

Six major companies dominate South Africa's defence market. These are the state-owned Denel and five private industrial firms, namely African Defence Systems, Advanced Technologies and Engineering, Grintek, Reunert and BAE Systems. Together, these companies make up about 90% of defence industry turnover (see Table 2 and Graph 1).

⁷ Ibid.

⁸ Aerospace, Maritime and Defence Association, 'The South Africa defence-related industries,' Centurion, Pretoria, 2005, p.6.

⁹ Ibid., p.2.

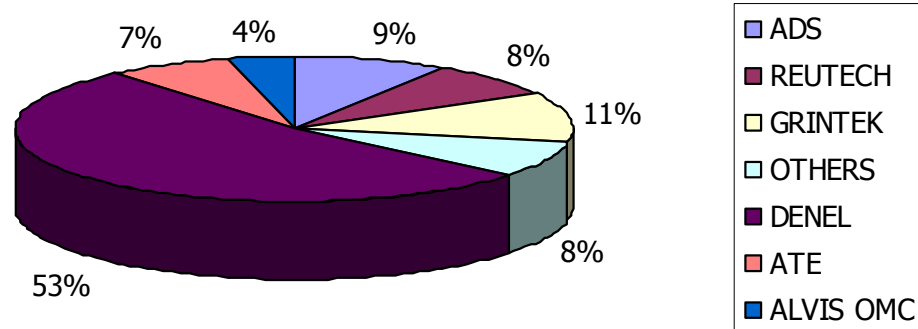
Table 2: Nature of the South African Defence-Related Industries

| PRIVATE COMPANIES | |
|--|---|
| <ul style="list-style-type: none"> • ATE • ADS • BAE Systems Land Systems OMC • AMT • IST Dynamics • CCII Systems • CyberSim • Demco • GISCOE • Grintek • Internex • M-Tek • Paramount Log • Parsec (Pty) Ltd • TAU Aerospace | <ul style="list-style-type: none"> • African NDT Centre • Aerosud • AMS • ASET • Aztec Components • Contractserve • Epsilon Eng • Flightcraft Aviation • IFS-Defence • LMT • Sediba Network • Siemens • Sinjana Eng cc • Thales Adv Eng • VRG Electronics • Waymark |

| |
|---|
| STATE OWNED <ul style="list-style-type: none"> • Denel (17 units) • Armscor • CSIR - Defencetek |
| ASSOCIATE MEMBERS <ul style="list-style-type: none"> • BAE Systems • Boeing Africa |
| HDI/BEE <ul style="list-style-type: none"> • Lechabile Quality Systems • FBS • Kgorong Investment • Bohlabela Wheels • Emzansi Eng Consultants • ANSYS |
| JSE LISTED <ul style="list-style-type: none"> • Tellumat • Reutech |

Source: AMD 2005

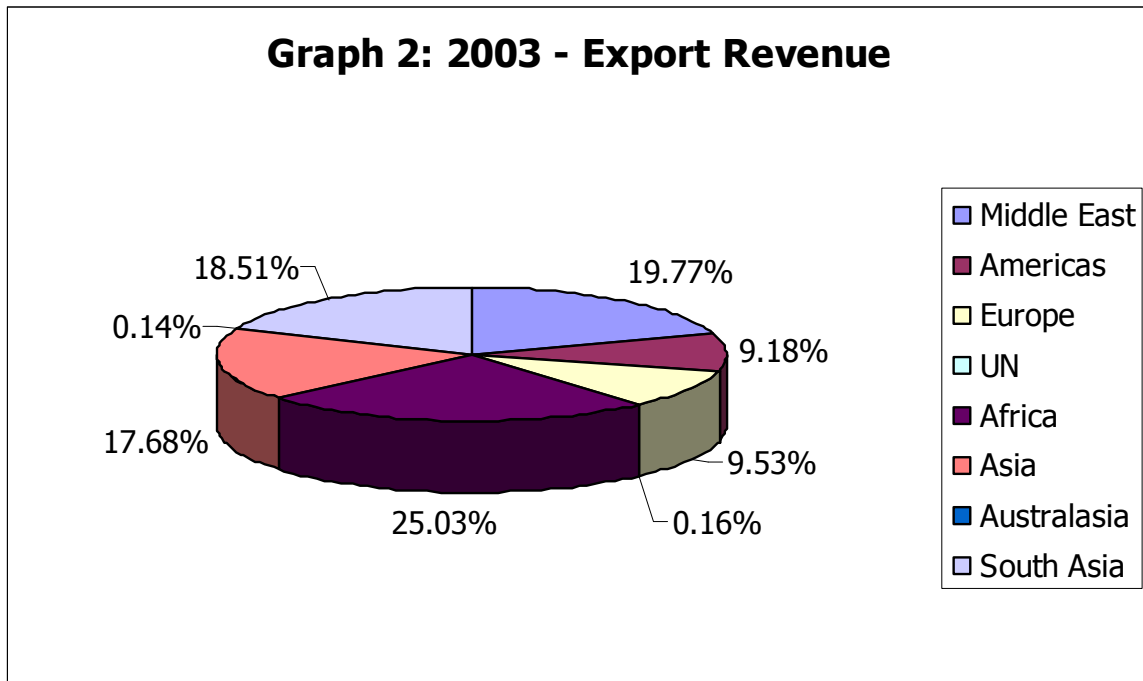
Graph 1: 2003 - Division of Revenue in the SADRI



Source: AMD 2005

In 2000, the defence industry turnover amounted to around R6 billion, with exports accounting for R1.8 billion (see Graph 2 for the geographical division of export revenues in 2003). The defence sector is an important national employer, providing direct and indirect employment for roughly 76

000 people. In the 1980s, employment figures in this sector reached a peak of 130 000. Cross-contracting and sub-contracting form an integral part of the operations of defence-related industries, and these include several commercial suppliers not necessarily involved in the armaments sector. And over 80% of these operations are concentrated in the Gauteng Province, predominantly in Johannesburg and Pretoria.¹⁰



Source: AMD 2005

3.3. Core competencies

The South African defence-related industries have a diverse core of capabilities in five categories:

- Weapon system or sub-system design, development, manufacture, integration and testing especially for land systems, including their ammunition and fuses.
- Upgrading and life extensions of existing systems.
- Logistic support defence systems.
- Electronics, including avionics for aircraft and helicopters, the guidance systems for missiles and gun and fire control systems.
- Other areas of competence include secure communications, electronic warfare, radar, command, control, communications, computing and intelligence.¹¹

Considerable competencies have also been developed in vehicle systems, simulators, unmanned aircraft and logistics. Key systems produced by the South African defence industry (most under licence and others from scratch) are the Impala Mk I and II, jet training aircraft, the Kudu, Bosbok light battlefield transport and reconnaissance aircraft, the Eland armoured car, the Ratel Infantry Fighting vehicle and the Oryx medium helicopter. In addition, there has been a significant rebuild

¹⁰ Ibid.p.6.

¹¹ Ibid., p.5.

and upgrade of the French Mirage III supersonic fighter aircraft, the G5 155 mm towed howitzer and G6 wheeled artillery systems, the Valkiri multiple rocket Launcher, the v3A Kukri short range air-to-air missile, the Minister-class fast-attack missile boat, the Rooivalk attack helicopter, the Seeker reconnaissance Unmanned Aerial Vehicle, the Lark anti-tank drone, and the Mokopa anti-tank guided munitions. Moreover, the South African defence industries have also carried out the development and manufacture of nuclear warheads and a space programme that encompasses a launch vehicle (missile) and a low orbit reconnaissance satellite.¹²

The South African National Defence Force (SANDF) considers several technologies and competencies to be strategically important, including: logistic support, repair and maintenance of equipment and systems; systems integration; command, control, communication, intelligence and information systems; sensors, signal processing and data processing; combat systems software and support; and simulation systems and war gaming. The SANDF recognises that it cannot rely solely on internal funding sources to maintain its key competencies and technologies. Increased exports and global market penetration are thus vital to the long-term viability and growth of the South African defence sector.¹³ The following issues will be accorded priority in the future:

- Harnessing globalisation and international partnerships.
- Retaining the SANDF as a base market.
- Promoting Black Economic Empowerment.
- Achieving a balance between government support and control.
- Exploiting industrial participation.
- Pursuing industry profitability.¹⁴

4. The South African aerospace sector

The South African government's vision is to develop the aerospace sector as a sustainable, growing and internationally recognised industry by 2014. To this end, the government has sought to position the sector as a high-value global manufacturing industry and a regional African transport hub. Given the vast wealth-generation potential of the aerospace industry, the growth of this sector is viewed as vital to future national economic welfare.¹⁵ As the Minister of Trade and Industry, Mandisi Mphahlele, pointed out at the opening the African Aerospace and Defence trade show and exhibition in 2005: "This industry falls squarely into our approach to economic development and we have seen that it has potential for export growth, value addition and through international sub-contracting agreements, stimulates industrial innovation, competitiveness and growth further down the supply chain."¹⁶

Over the past five years the government – through the Departments of Trade and Industry (DTI), Science and Technology (DST), Defence, Transport, and Public Enterprises – has collaborated with the local industry, labour unions, academic institutions and other stakeholders to recast the

¹² Ibid., p.6.

¹³ Ibid., p.4.

¹⁴ Ibid., p.3.

¹⁵ Interview with Mr Francois Denner, Chief Director: Strategic Competitiveness, Department of Trade and Industry.

¹⁶ Department of Trade and Industry, 'Repositioning the South African aerospace industry as a priority sector – the contribution of the Airbus Military A400M programme,' Pretoria, 2005.

industry as a national high priority sector whose growth trajectory could be modelled on that of the successful automotive sector. In accordance with its Integrated Manufacturing Strategy, the DTI has unveiled the Aerospace Industry Support Initiative (AISI). The AISI is an implementation strategy designed to bolster South Africa's aeronautical, space and defence industries and ensure their full integration into global aerospace supply chains. It seeks to achieve these objectives by:

- Improving the global competitiveness of the South African aerospace industry.
- Providing an institutional platform to encourage partnerships and innovation between government, industry and academia.
- Identifying, developing and promoting the interests and capabilities of the South African aerospace industry.
- Accelerating the achievement of government strategic objectives including growth, employment and equity.

South Africa's aerospace competitive strengths revolve around avionics, aerospace systems development, and production of airframes and engine components. Other capabilities and expertise include inertial sensor systems, testing services, missiles, unmanned aerial vehicles, integrated logistic support, protection systems (for air, sea and land based applications), observation and sighting systems, air defence production, and training.¹⁷

The AISI draws on the work of other government departments, such as the Department of Science and Technology's Advanced Manufacturing Technologies Strategy (AMTS). The AMTS Aerospace Network stresses the importance of innovation, technology and skills to the sustainable growth of the aerospace sector, and seeks to promote the development of human resources, as well as technological capabilities and research to underpin the AISI. The political support accorded to the AISI has also been underscored by the backing given respectively by the Ministers of Public Enterprises and Defence for Denel's involvement in the A400M programme with Airbus Military SL. Denel has embarked upon a change strategy to recast its business from competing as an independent systems supplier of a broad range of products in the global market to firmly establishing itself in the supply chains of global defence contractors as a preferred supplier of sub-systems and components. To this end, it has sought to forge selective equity partnerships and alliances with global defence contractors.¹⁸

The AISI is predicated on the recognition that South Africa should exploit its competencies and technologies optimally and use them as a platform not only to forge international partnerships with the major aerospace original equipment manufacturers (OEMs) such as Airbus, Boeing and Embraer, but also to promote its national development objectives. This has necessitated the creation of integrated supply chains connecting the OEMs, leading 'first-tier' South African contractors and clusters of small and emerging companies. The intention is to ensure that the supply chains echo those found in the automotive sector, which are underpinned by clusters of automotive suppliers in South Africa that are integrated into global networks. It is hoped that this will benefit South Africa by, among other things, moving suppliers up the value chain, inducing economies of scale, and generally contributing to the development of the local industry.

The A400M aircraft programme provides pointers as to how the South African government and industry intend to realise the restructuring of the aerospace sector. This is an international partnership arrangement launched in 2003 involving South Africa and seven European partners (France, Spain, Luxembourg, Turkey, Germany, Belgium, and the United Kingdom), which is aimed

¹⁷ Culled from data provided by Denel and Grintek.

¹⁸ Interview with Mr Tristan La Grange, Group Marketing Manager: South America, Denel.

at designing and building the A400M military air transport plane. The programme's main contractor is Airbus Military SL, an Airbus subsidiary. In April 2005 the South African government signed a contract to purchase 8 aircraft and will take first delivery in 2010. As a quid pro quo for the aircraft purchase, South Africa has been guaranteed design-and-build contracts valued at approximately €400 million for the first 188 airplanes, with an extra €350 million expected from future exports.¹⁹

South Africa's participation in the A400M programme has been influenced mainly by industrial considerations. But it has also been driven by foreign and security policy factors, especially the imperative of expanding South Africa's role in conflict prevention, peacekeeping operations and humanitarian missions across Africa. Given the limitations of the current South African military transport infrastructure, it is expected that the new transport aircraft will go a long way towards meeting the SANDF's needs and contributing towards the creation of a sustainable development of the aerospace industry in South Africa.

Denel and Aerosud have been designated as primary South African contractors and will supply the A400M programme with a range of components including wing tips, wing-to-fuselage fairings, centre top shells, composite cargo hold, nose fuselage linings and other composite and metallic airframe components. Negotiations are underway to include parts of the engine and communication systems. Furthermore, both companies will undertake equipment repairs during the programme's lifespan, and they are expected to compete for the provision of aircraft maintenance and training services. The final assembly of the aircraft will take place in Seville, Spain. The A400M programme represents a clear opportunity for Denel and Aerosud to be incorporated into the world's biggest aviation supply chain.²⁰

Aerosud, the privately owned company that produces aircraft components and aerostructure, has benefited immensely from the government's industrial participation policy. The policy derives from the government's strategic defence procurement programme and commits armaments companies to providing industrial offsets in return for contracts awarded to them. Designed to create or retain over 65 000 jobs and generate R104 billion worth of investments, the offsets include direct investments, export assistance, undertakings to utilise parts made in the purchasing country, and relocation of final assembly functions to that country.²¹

Thanks to the industrial participation policy, Aerosud has succeeded to penetrate the global aerospace markets and secure several long-term contracts. The company's order book currently stands at R4 billion, with 15 contracts having a lifespan of more than five years. It won a contract to become the exclusive supplier of plastic interior parts for Boeing, and it also designs and makes aircraft interiors for Airbus. Over the past two years, Aerosud has exported over 70 000 parts to these major airline companies. In addition, the company has become a supplier of galley systems for 100 new Airbus A320 aircraft bought by IndiGo, the low-cost Indian airline. And it has entered into a R650 million strategic alliance with BAE Systems that provides for skills and technology transfer and an order for the export of Airbus A320 jetliner wing components from South Africa.²²

BAE Systems has a 30% equity stake in Denel, which was acquired as part of South Africa's arms procurement package. In terms of the package, the South African government was offered an industrial participation package by BAE Systems and Saab in return for buying Hawk and Gripen

¹⁹ Department of Trade and Industry, 'Repositioning the South African aerospace industry as a priority sector – the contribution of the Airbus Military A400M programme,' Pretoria, 2005; Interview with Mr Francois Denner, Chief Director: Strategic Competitiveness, Department of Trade and Industry.

²⁰ Ibid.

²¹ Ibid.

²² Rob Cokayne, 'Industrial participation policy boosts Aerosud's growth,' *Business Report*, 17 November 2005.

aircraft. As part of its partnership with BAE Systems, Denel was awarded contracts to supply aircraft tooling for the production of the Indian Air Force's new BAE Systems Hawk advanced jet trainer aircraft.²³

In addition to Aerosud and Denel, South African firms have forged linkages with other international companies. Grintek has established joint ventures with Saab in Sweden and EADS in Germany, which are focused on providing shared R&D and shared marketing of products. Other international partners include Snecma, Volvo Aero, Honeywell, Lockheed and MTU. The industrial participation programme offers South African aerospace and defence firms an opportunity for long-range entry into global supply chains. But it remains to be seen whether the domestic industry can take maximal advantage of these possibilities.

5. Prospects for IBSA strategic cooperation: sector study findings

5.1 South-South cooperation

The importance of strategic cooperation among the IBSA countries in the aerospace industry has been championed at the highest political level in South Africa. During the visit of the Indian Head of State to South Africa in September 2004, President Thabo Mbeki called on the IBSA countries to work together to intensify trilateral cooperation in the aerospace sector and indicated that South Africa was ready to share its capabilities, technologies and expertise with its IBSA partners in this regard.

The interviews revealed that there was currently no or very little form of aerospace collaboration between South Africa, India and Brazil. There was general agreement among the respondents on the need for cooperation in this respect. As a start, it is important to ask what the rationale for such cooperation should be? Is the objective of cooperating to compete with Boeing and Airbus, or to have a sustainable high-tech industry that can provide skilled employment while making available tailor-made products at reasonable prices? In addition, it is necessary to identify each country's requirements and capabilities.

Although it was felt that it was difficult to discuss comprehensively at this stage the levels at which cooperation among the IBSA countries should be pitched, as this was not easily quantifiable in specific terms, there was a clear recognition among most respondents that the three countries found themselves in similar positions and that they needed to collaborate to develop their indigenous industries if they were to counter domination by the major industrial countries.

Broadly, three potential areas of cooperation have been identified as part of the agenda of the IBSA Working Group on Trade. The first area is expansion of aerospace supply chains. This is premised on the commercial opportunities offered by the diverse aerospace capabilities of the IBSA countries. In particular, it centres on the prospects promised by Brazil's Embraer, the world's third largest commercial airline manufacturer that produces regional aircraft. From a South African perspective, it is envisioned that the demand for regional aircraft in Africa will grow in the near future, with commercial carrying capacity in the region expected to double over the next 6 years. Not only does this provide considerable opportunities for the provision of a South African-based aircraft maintenance, modification and upgrade infrastructure to service a regional African jet fleet, it also has the potential to generate significant employment and spin-off companies. With its most developed industrial and commercial infrastructure on the African continent, South Africa could act as a springboard for the OEMs into the region.²⁴

²³ Interview with Mr Tristan La Grange, Group Marketing Manager: South America, Denel.

²⁴ Interview with Mr Francois Denner, Chief Director: Strategic Competitiveness, Department of Trade and Industry.

Second, collaboration around aerospace systems in support of strategic defence needs. The global trend toward the industrialisation of defence production – typified increasingly by the development of weapons systems through international linkages – provides clear opportunities for integrating the domestic defence industry into global supply chains. This can be accomplished through international strategic alliances, which are crucial to pursuing high-value manufacturing programmes and mitigating potential risks to individual economies. Previous experience has shown that such global partnerships can produce important economic gains and spillovers, especially the transfer of skills and technology. Within this context the South African Department of Defence (supported by the DTI) has been engaged in discussions with the Brazilian authorities with a view to either upgrading or replacing some of that country's ageing airforce hardware – mainly fighter jets but also supporting sub-systems. Denel has set up an office in Brazil to beef up cooperation with the Brazilian defence sector.²⁵

With a strong electronics competitive edge, Grintek has made progress in entering the Indian market. Taking cognisance of India's growing defence spending, robust defence and aeronautical industry plus high ambitions, the company seeks to share its technology and supply Indian fighter aircraft with self-protection systems.²⁶ Based on 2004 figures, defence spending in India amounted to US\$16.97 billion, compared with US\$11 billion and US\$3.172 billion spent by Brazil and South Africa respectively (see Table 3).²⁷

Table 3: Military expenditures – selected countries, 2004

| Rank | Country | Amount |
|------|---------------|----------------------|
| 1 | United States | \$370, 700, 000, 000 |
| 4 | France | \$45, 238, 100, 000 |
| 7 | Italy | \$28, 182, 800, 000 |
| 9 | India | \$16, 970, 000, 000 |
| 13 | Brazil | \$11, 000, 000, 000 |
| 21 | Sweden | \$5, 729, 000, 000 |
| 31 | Chile | \$3, 420, 000, 000 |
| 34 | South Africa | \$3, 172, 000, 000 |

Source: CIA World Factbook, 2005

Yet these prospects are being threatened by the furore sparked by corruption allegations levelled against Denel by the Indian government. Denel has been accused of paying bribes to secure contracts to supply India with arms. Specifically, the allegations stem from a R24 million contract to supply the Indian government with 400 anti-matériel rifles and an R88 million contract to supply 9000 rounds of ammunition. Following the publication of the corruption accusations at the beginning of October 2005, the Indian government announced that it had cancelled all its arms contracts with Denel. Denel has denied any wrongdoing and a legal process has ensued to settle the dispute.²⁸

The third possible field of collaboration is around small and micro satellites. Brazil and India possess strong competencies in small and micro satellites, including launching capability, while South Africa has a small but reputable small and micro satellite industry and fully-fledged ground support infrastructure. It was indicated that the IBSA nations stood to gain from a more coordinated and integrated approach in these fields, particularly in exchanging expertise and

²⁵ Interview with Mr Tristan La Grange, Marketing Manager: South America, Denel.

²⁶ Interview with Messrs Mark Minnies and Gerrie Radloff, Senior Business Development Executives, Grintek.

²⁷ I am grateful to Mr Piet Smit, Managing Director - Reutech, for bringing these figures to my attention.

²⁸ Peter Fabricius, 'Denel denies dodgy deal,' *The Star*, 4 October 2005.

technology platforms and in fostering closer working relationships between both public and private sectors in the three countries.²⁹

In addition to the above proposals, a suggestion has been made for a common development project (R&D oriented) aimed at developing new technology and sustaining strategic resources and/or a joint capital equipment acquisition/replacement programme where non-recurring costs may be distributed across a broader base.³⁰ Another suggestion was that cooperation should start with a clear strategy to pool resources (not physically but conceptually) and then buy from those resources on a sustainable basis.³¹

Concerning the role that the aerospace industries could play in supporting small and medium-size enterprises (SMEs), through well-defined supply chains, and in creating wealth and employment, it was pointed out that SME development could only take place in the presence of major partners in each country, for example Aerosud or Denel in South Africa. It was not possible for SMEs to participate independently given the high cost and infrastructure barriers. Aerosud has been actively developing sub-tier supply by SMEs and has successfully solicited European Union finance through the DTI for this.³²

5.2. Capabilities

Respondents asserted that there was sufficient scope for cooperation among the IBSA countries to develop better technological capabilities in aircraft and aircraft components production. Even so, it was stated that perhaps the first step should be the initiation of dialogue between aviation players in each country and to hammer out a strategy from there. Such a strategy could include each country buying from one another on a preferential basis. A question was raised regarding whether there was a place in the plans of Brazil and India for South Africa to contribute.

Furthermore, the South African aerospace industry could exploit its competitive niche areas to integrate South African manufacturers into Brazilian and Indian aircraft production sectors through, for example, risk-sharing development and government-supported marketing efforts at the electronic product level. Regarding the prospects for cooperating with India and Brazil on developing an airplane, a number of concerns were raised about this kind of cooperation including a lack of funding, a lack of defence coordination, and a lack of a market that is prepared to buy from the IBSA grouping.³³

Nevertheless, there was a general view that the IBSA nations do possess the necessary infrastructure to develop a vibrant aerospace sector. And there is a great deal of scope for cultivating complementary niches rather than each country having to wholly finance its industry. South Africa's infrastructure capabilities vary. R&D spending remains low, although it is growing thanks partly to the AISI programme. In general, South African universities offer useful courses and the South African aviation baseload underpins the appointment of new engineers. The South African aerospace sector has skilled personnel, and there has been a determination to improve the industry's skills base. For example, Aerosud is planning to increase its staff from 300 to 700 within two years so as to fulfil its current contract obligations and has been investing in skills training in partnership with the DTI and DST.³⁴

²⁹ Interview with Mr Francois Denner, Chief Director: Strategic Competitiveness, Department of Trade and Industry.

³⁰ Interview with Mr Ralph Mills, Manager: Strategy, African Defence Systems.

³¹ Interview with Mr Piet Smit, Managing Director, Reutech.

³² Interview with Dr Paul Potgieter, Group Managing Director, Aerosud.

³³ Interview with Mr Piet Smit, Managing Director, Reutech.

³⁴ Interview with Dr Paul Potgieter, Group Managing Director, Aerosud.

South Africa needs to bolster its financial resources. The Industrial Development Corporation is willing to offer financial support in instances where there is a viable business case. The country also needs to increase investment in manufacturing facilities and capital equipment. Some companies, notably Aerosud, have led the way in investing in modern production methodologies and in increasing production output.³⁵

5.3. The role of government

The interviewees acknowledged that the South African government, by providing a policy framework and incentives, has demonstrated a proactive approach to developing the aerospace sector and furthering international cooperation. There was in principle general agreement that the government ought to play a central role in: growing the aerospace sector and providing strong direction; collaborating with IBSA countries on ambitious projects; addressing concerns around import duties, tariffs, manufacturing and investment incentives, and transaction costs; and providing subsidies for collaborative investment and manufacturing programmes.

5.4. Value addition

It is important for the IBSA countries to discuss how they can add value to aircraft production. Both Europe and the USA are high-cost manufacturers and this offers opportunities for emerging economies. It is worth bearing in mind, though, that aviation is a high-risk business requiring very large up-front investment with long term break-evens. It is not a business that readily lends itself to entrepreneurship in the absence of government incentives.³⁶

It is debatable whether there is an opportunity for a new low-cost engine maker in the world. If so, the main cost saving will only be production man-hour rates but under subcontract from an existing engine manufacturer. The development of a new engine will be prohibitively expensive even if the technology to successfully do so was to be made available. The starting point should be cooperation on existing programmes such as the Embraer regional aircraft.³⁷ The value addition and cooperation instruments that are likely to yield optimal benefits are boosting R&D, encouraging shared research, as well as cultivating joint marketing arrangements and technological exchanges.

5.5. Challenges/threats to IBSA cooperation

As stated earlier, the corruption allegations levelled against Denel by the Indian government represent arguably the most important challenge and threat to cooperation among the IBSA countries in the aerospace sector. This has significant implications for Indo-South African bilateral relations and the seriousness of the matter warrants intervention at the 'highest political level.'³⁸ Furthermore, it was stated that another issue that ought to be resolved is the restructuring of Denel and a clear delineation of its relationship with established private industry, which is a prerequisite for foreign links.

Another challenge concerns the extent of the willingness and capability of the IBSA countries to develop a common interest. Considering that the three countries have been vying to position themselves in an already congested global aviation market, the challenge is whether they can promote cooperation as opposed to competition. Fostering cooperation is possible but, as one respondent emphasised, it will require a 'win-win focus project' to realise.³⁹

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Interview with Mr Tristan La Grange, Group Marketing Manager: South America, Denel.

³⁹ Interview with Dr Paul Potgieter, Group Managing Director, Aerosud.

At a commercial level, there is the challenge of reconciling the dilemmas faced by South African and Brazilian defence industries, both of which have been experiencing the same problems of over-capacity against the backdrop of declining defence expenditure. This has resulted in companies in these countries viewing the IBSA arrangement not in terms of cooperation but rather as a means of opening new markets. A related concern is the perception that the IBSA mechanism seems to have been revolving around South Africa, with limited India-Brazil activity. This perception needs to be dispelled if the IBSA is to be taken seriously by the aerospace sector.⁴⁰

IBSA cooperation might also be influenced by the attitude of Indian and Brazilian partners to the transformation of the defence-related industries in South Africa that has been taking place in keeping with the government's policy of black economic empowerment (BEE). BEE is designed to facilitate the entry of emerging businesses and the previously marginalised black entrepreneurs into the defence and aerospace sectors by, among other things, helping these enterprises to overcome the stringent technical barriers that prevent small and emerging companies from participating in the industry. Early in November 2005 Phatsima Aviation – a BEE company – acquired a 20% stake in Aerosud, increasing Aerosud's total BEE shareholding to 28%.⁴¹

A further issue that needs to be tackled is whether the Airbus/A400M strategy pursued by South Africa can be balanced against South-South cooperation within the IBSA context. Moreover, there is a challenge of dealing with matters related to transaction costs, shipping costs and delivery times.

6. Conclusion and way ahead

The interviews with representatives of aerospace and defence companies highlighted a clear general interest on the part of these firms in the proposed IBSA aerospace cooperation programme. As the report has underlined, some justifiable doubts and misgivings were raised about the efficacy of the scheme but these were overwhelmingly overshadowed by a desire and enthusiasm to build relationships with Brazilian and Indian aerospace companies as reliable and valued business partners. This should provide a starting point for commencing a substantive dialogue among the IBSA nations. The DTI in South Africa has offered to make its offices available next year to host a preliminary meeting of aerospace players in the IBSA countries to explore ideas, proposals, plans and strategies that can take the aerospace initiative forward. And it has asked SAIIA to liaise with CUTS and ICONE with a view to setting up such a meeting at the earliest opportunity in 2006. SAIIA proposes that this meeting be held in Pretoria the end of April 2006. If this gathering succeeds to lay a firm foundation and yields meaningful outcomes, it is hoped that it will lead to follow-up meetings in Brazil and/or India.

⁴⁰ Interview with Mr Ralph Mills, Manager: Strategy, African Defence Systems.

⁴¹ Rob Cokayne, 'Industrial participation policy boosts Aerosud's growth,' *Business Report*, 17 November 2005.

Appendix A: Company Statistical Information

Aerosud

Name of interviewee: Dr Paul Potgieter

Name of company: Aerosud

Area of operation: Aircraft structures design and production, involving sheetmetal, plastic and composite technologies, aircraft upgrades and airline interior products.

Number of employees: 350

Annual sales: ZAR200m

Annual exports: 95% of turnover

Annual imports: Mainly raw material, about 30% of turnover

Primary exporting destinations: USA, Europe

Primary importing destinations: Suppliers of approved aircraft materials, mainly USA and Europe

African Defence Systems

Name of interviewee: Mr Ralph Mills

Name of company: African Defence Systems

Area of operation: Defence Industry

Number of employees: 220

Annual sales: ZAR450m

Annual exports: Very variable – ZAR30m

Annual imports: Depends on foreign content of programmes - ZAR40m

Primary exporting destinations: Middle East

Primary importing destinations: Europe (France in particular)

Grintek

Name of interviewee: Messrs Mark Minnies and Gerrie Radloff

Name of company: Grintek

Area of operation: Avitronics

Number of employees: 400

Annual sales: ZAR350m

Annual exports: 85% of above

Annual imports: 25% of above

Primary exporting destinations: Middle East, Europe

Primary importing destinations: USA, Far East, Europe

Denel

Name of interviewee: Mr Tristan La Grange

Name of company: Denel

Area of operation: Marketing, South America

Number of employees: 10 000

Annual sales: ZAR2bn

Annual exports: 75% of above

Annual imports: Difficult to quote figures because the different Divisions import components from a vast range of international suppliers

Primary exporting destinations: Middle East, Asia Pacific, South America, Europe and USA

Primary importing destinations: See remark under "Annual Imports"

Reutech

Name of interviewee: Mr Piet Smit

Name of company: Reutech

Area of operation: Military electronics

Number of employees: 700

Annual sales: ZAR400m

Annual exports: USD 30m

Annual imports: USD15m

Primary exporting destinations: Middle East, South Asia, Africa, Europe

Primary importing destinations: Europe

Appendix B: Aerospace Industry Tiers

| Tier | Description | Descriptors |
|-----------------------------------|--|---|
| <p>1. Complete system</p> | <p>An entire aircraft with all the required sub systems already fully integrated. This tier could also include logistics support, upgrade and maintenance of the system for a specified period.</p> <p>Examples</p> <ul style="list-style-type: none"> • Roovalk helicopter • Airbus A380 • Hercules C130 <p>Players</p> <ul style="list-style-type: none"> • Denel • Airbus • Boeing • Lockheed-Martin • Embraer | <ul style="list-style-type: none"> • Highest value added products • System/business integrator level • Low volumes • High level human resources • Very little manufacturing • Mostly assembly |
| <p>2. Major sub-system</p> | <p>Sub-systems that are made up out of a significant number of minor sub-systems. This would still involve a level of system integration not dissimilar from the first tier</p> <p>Examples</p> <ul style="list-style-type: none"> • Complete powerplant • Main airframe sections (e.g. wing) • Undercarriage • Complete avionics system <p>Players</p> <ul style="list-style-type: none"> • Rolls-Royce • GE • Snecma • ATE • Bombardier | <ul style="list-style-type: none"> • High value added products • System integrator • Low volumes • High level human resources • Little manufacturing • Assembly |
| <p>3. Minor sub-system</p> | <p>A defined assembly of components indivisible into other systems.</p> <p>Examples</p> <ul style="list-style-type: none"> • Aerodynamic control surfaces (flaps) • Gearboxes • Navigation systems | <ul style="list-style-type: none"> • Medium value added products • Sub-contractor • Medium volumes • Medium level human resources • Production skills • Manufacturing • Assembly intensive |

| | | |
|---------------------|---|---|
| | <ul style="list-style-type: none"> • Weapons and ordinances • Computer systems <p>Players</p> <ul style="list-style-type: none"> • Denel • Aerosud | |
| 4. Component | <p>A device with a clear function that is of no use unless integrated into a tier 3 system.</p> <p>Examples</p> <ul style="list-style-type: none"> • Electrical circuit boards • Machined engine parts • Valves and pumps <p>Players</p> <ul style="list-style-type: none"> • Turbomeca Africa • Smiths | <ul style="list-style-type: none"> • Medium value added products • Sub-contractor • High volumes • Medium level human resources <ul style="list-style-type: none"> ○ Production skills • Predominantly manufacturing • Assembly intensive |
| 5. Part | <p>A unit that can be defined as a single monolithic part. In some cases the part has not had any value added to it through for instance assembly or machining processes.</p> <p>Examples</p> <ul style="list-style-type: none"> • Un-machined castings • Shafts • Rivets • Electrical components such as resistors capacitors...etc <p>Players</p> <ul style="list-style-type: none"> • Snecma foundry • Denel foundry • Westland | <ul style="list-style-type: none"> • Low value added products • Sub-contractor • Highest volumes • Medium level human resources • No integration • Solely manufacturing • No assembly |

Source: DTI Assegai strategy, 2003.

Appendix C: IBSA Sector Study Questionnaire

Statistical Information

| | |
|--------------------------------|--|
| Name of Interviewee | |
| Name of Company | |
| Area of Operation | |
| Number of Employees | |
| Annual Sales | |
| Annual Exports | |
| Annual Imports | |
| Primary Exporting Destinations | |
| Primary Importing Destinations | |

General

1. What is the state of the South African aerospace industry?
2. Where is South Africa's aerospace industry heading?
3. Where should South Africa's aerospace industry be heading?

IBSA Economic Relationship

4. What are the countries that you import from/export to? (Brazil/India)
5. Why are you importing/exporting from these countries? (Costs, market access, product availability, product quality)
6. Are you aware of the IBSA Initiative?
7. Are you aware of the aerospace industry in Brazil and India?
8. In the future, are you looking forward to exporting/importing/investing/receiving investment from Brazil and India?

South-South Cooperation

9. Are you aware of any form of aerospace cooperation between South Africa and any other country?
10. Is there any form of aerospace collaboration amongst South Africa, India and Brazil?
11. At what level(s) can the aerospace industries in the IBSA countries pitch their cooperation? Whole aircraft and huge sub-system manufacture? Component and simple sub-system manufacture? Etc
12. Do you have any other ideas for cooperation, for e.g. making and not assembling engines?
13. The international aerospace industry is heavily tilted towards the industrialised countries, with the United States accounting for the lion's share of the global market and employment

figures. How can the IBSA countries work together to tackle entry barriers (e.g. certification requirements) to the international aerospace industry?

14. How can the aerospace industries in the IBSA countries exploit their strategic positions in their respective economies to create wealth and employment, for example by supporting SMEs (directly or indirectly involved in aerospace) through well-defined supply chains?

Capabilities

15. Does India have the capability to manufacture a commercial 400 seater airplane?
16. How can the IBSA countries cooperate to develop better technological capabilities in the field of aircraft and aircraft components?
17. How can the Indian aerospace industry exploit niche areas in which it has an advantage to integrate Indian manufacturers into Brazilian/Indian aircraft production sectors?
18. What are the prospects for cooperating with Brazil and India on developing an airplane, which can compete with Boeing and Airbus? What are the hurdles?
19. What are the major concerns that you have in this cooperation? Lack of trust, poor capabilities etc
20. Do IBSA countries have the required infrastructure to develop a vibrant aerospace sector?
- a. Government Support
 - b. R&D
 - c. Educational Institutions
 - d. Skilled Human Resources
 - e. Financial Resources
 - f. Manufacturing efficiency/facilities
 - g. Capital equipment.
22. How can IBSA countries organise the aerospace supply chain? Can they learn from the Airbus experience? How can the distance element be tackled?
23. How can the IBSA countries achieve competitive, cost-effective production, faster delivery times, improved quality levels and greater flexibility?
24. How can the aerospace technological divide between the IBSA countries and the developed countries (US, EU) be bridged?
25. How can the aerospace industries in the IBSA countries successfully integrate themselves into global supply chains (e.g. Airbus's global supply chain) as valued and reliable partners?

Value Addition

25. How can the aerospace industries in the IBSA countries successfully integrate themselves into global supply chains (e.g. Airbus's global supply chain) as valued and reliable partners?
26. Is there a need for a Southern airplane?
27. Is there an opportunity for a new low-cost airplane maker in the world?

28. Is there opportunity for a new low-cost engine maker in the world?
29. Is there a missing link that can be targeted; E.g. R&D, design capabilities etc
30. What form of value addition and cooperation instruments do you envisage in the future with regard to IBSA cooperation?
- a. Locking in to developed country manufacturing systems,
 - b. Developing Southern manufacturing systems,
 - c. Focus on R&D
 - d. Shared research
 - e. Joint marketing arrangements
 - f. Technological exchanges

Role of the Government

32. What role should the government play in developing the aerospace sector and furthering IBSA cooperation?
- a. Developing aerospace sector in general, without playing a role in the direction of specialisation
 - b. Opening the civil aerospace industry for FDI
 - c. Collaborating with IBSA countries on ambitious projects
 - d. Addressing issues around import duties, tariffs, manufacturing and investment incentives, and transaction costs etc.
 - e. Subsidies for collaborative investment and manufacturing programmes
33. What form of public investment is required to build a vibrant aerospace sector?
34. What structure should be in place for government cooperation in the aerospace sector within IBSA countries?
35. What form of public-private partnership is envisaged for developing the aerospace sector?

Threats

36. Are there any trade offs between cooperation with Southern countries and business with Northern?
37. Will cooperation between IBSA countries be any better than cooperation with developed countries with respect to economic and development gains?

END