



# The development and initial implementation of South Africa's national space policy



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## ABSTRACT

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South Africa is one of the few countries in Africa that has codified a national space policy. South Africa's first public national space policy was adopted in 2009. The policy has given direction and purpose to the country's recent space activities. Prior to this, space activities in South Africa were disparate and uncoordinated. Because space policy is not a primary policy issue, but rather an ancillary policy issue, the development of space policy had to be couched in terms that made it clear to policymakers exactly how space activities would contribute to national development and other policy priorities. This required building capacity in government to engage in policy discussions around these issues. We describe the process that was followed to raise the political profile of space affairs to the point that it became a policy issue for the South African government. The policy development narrative is arranged in a series of ten goals that were addressed during the policy development process. These goals speak to how one can address the political and systemic challenges of space policy formulation in the context of an emerging space nation that is also a developing country. The goals may thus be of interest to other emerging space nations at a similar stage in their development.

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## 1. Introduction

It has been said that politics, far more than nature, abhors a vacuum. Unlike nature, though, where air rushes in to fill a vacuum, politicians and civil servants do not necessarily rush to fill policy vacuums, but often avoid them! The reason for this is that government bureaucracies are often reluctant to operate outside of their political mandates, especially in areas that may be perceived as politically risky and/or the preserve of other, better-resourced countries. This is the situation in which South Africa found itself in the early 2000s, when there were a number of disparate and uncoordinated space activities carried out by a variety of public and private sector actors, but without any guiding policy context. In the policy vacuum prevailing at that time, there was no incentive for government to support or carry out space activities, with the result that the country was gradually falling further behind in its capacity to harness space technology for development.

This paper describes the process that was followed in the development of South Africa's first public national space policy, from the first impulses in 2003 to the launch of the policy in 2009.

As is usual in such developments, the process began with the initiative of a few dedicated individuals, and soon grew to encompass a significant number of Departments. We describe the process that was followed, and the structures that were developed, to build a wide base of support in government for the space policy initiative.

We first set the scene for the policy development narrative by recounting the key developments in the South African space arena that led to the status quo described above. The policy development narrative is divided into two periods: 2000–2005, the period of laying the foundations and creating the structures for space policy development, and the period 2006–2009, during which the policy was formulated. We then consider the first five years of implementation of the space policy and discuss some of the challenges that have been encountered during this period.

We have expressed the narrative as a series of ten goals, which are denoted by roman numerals throughout the text. These goals can be thought of as a succinct summary of the steps that were followed in the development of the South African space policy. Each goal addressed a specific challenge that was encountered or anticipated in the development of the space policy.

As we will discuss in Section 4, space policy is ancillary policy, that is, policy in support of primary policy in areas such as human

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and environmental security, peace and stability, etc. The goals speak to how one can address the political and systemic challenges of space policy formulation in the context of an emerging space nation that is also a developing country. The goals may thus be of interest to other emerging space nations at a similar stage in their development.

The content of the new South African space policy has been discussed in detail in an article in *Space Policy* by Munsami [1], and we will not repeat that discussion here. Instead, in this paper we focus on the policy formulation process that was followed and try to draw some lessons from those experiences that may be of benefit to other emerging space nations.

## 2. The pre-2000 period: space as a Cold War activity

Space activities in South Africa date back to the very early days of the Space Age, when the country hosted facilities to support the space activities of the Western powers, mostly in the way of ground-based tracking, telemetry and command of satellites. Among the facilities erected on South African soil during the early 1960s, the most prominent was NASA's Deep Space Station 51, at Hartebeesthoek, which supported a significant number of lunar and planetary exploration missions, including the reception of the first images of the surface of Mars in the historic Mariner IV flyby on 15 July 1965.

During the 1970s the nationalist government's segregationist policy of separate development, called *apartheid* (literally meaning "apartness"), came under increasing domestic and international criticism, and the government adopted a series of unpopular measures that led to the increasing international political and military isolation of South Africa in the late 1970s and 1980s. During the 1960s and 1970s, there had been a series of revolutions on the African subcontinent in which former colonial regimes had been replaced with socialist and communist regimes that harboured the military forces of the anti-*apartheid* liberation movement. Aerial reconnaissance also revealed a significant and growing Cuban and Soviet military presence on the sub-continent. With the strengthening of the air defences in the neighbouring countries, the South African Air Force could no longer carry out aerial photoreconnaissance missions with impunity over those countries. The nationalist government therefore decided to develop a satellite reconnaissance programme. This entailed creating the capacity to design, build, test, launch, operate and replace at regular intervals a series of reconnaissance satellites. The launcher developed for this system served a dual military function; namely as a medium-range ballistic missile, which coupled to the country's nuclear weapons programme, gave it a regional nuclear deterrent capability. The necessary satellite and rocket testing, integration and launch facilities were developed in the Western Cape region in the early to mid-1980s. The launcher and satellite development work was carried out in collaboration with Israel and three suborbital test flights of the launch vehicle were performed. The South African space programme of the late 1980s was probably the last of the Cold War space programmes, and it was driven by the fear that the Soviet and Cuban-backed anti-*apartheid* liberation movement forces in the neighbouring countries could lead a communist takeover of South Africa. As the nationalist government could not count on open political and military support from the leading Western powers, it had to adopt a more self-reliant defence posture.

The Cold War logic that gave birth to South Africa's clandestine military-backed launcher and reconnaissance satellite programme of the 1980s (and with it the establishment of significant infrastructure for the development, testing and launching of space systems) suddenly evaporated with the break-up of the Soviet Union in 1991. As the country moved to a negotiated political

transition, other established space powers were concerned about the ability of the incoming government to contain missile technology proliferation risks and placed pressure on Pretoria to terminate its space programme. The South African Space Affairs Act (Act 84 of 1993) and the Non-Proliferation of Weapons of Mass Destruction Act (Act 87 of 1993) were passed just one year before the hand-over of power to a democratically elected Government of National Unity. For the incoming government, space activities were perceived, at least politically, in the context of disarmament, rather than in the context of societal benefits. This meant that there was no political impetus for policy development in this area.

Following the termination of the launch vehicle programme in 1992, attempts were made by the Denel defence industrial group, the prime contractors for the space programme, to commercialise the satellite programme under the name Greensat, but those attempts ultimately failed and the satellite programme was cancelled in 1994.

In the absence of a political direction to guide space activities, such activities as there were in the mid-to late-1990s took place in an isolated, uncoordinated *ad hoc* fashion at the institutional level and in a policy vacuum at national level. This is not to say that the activities were not technically sound. Indeed, when considered from a purely technical perspective, the accomplishments were impressive and demonstrated competence in some of the core areas of space technology. However, there was no policy vehicle that allowed government to harness these capabilities in a purposeful manner in support of national development objectives. One example of such an activity was the completion in 1998 of the Sunsat satellite by a group of academics and students at the University of Stellenbosch. Sunsat was a 64-kg microsatellite with an imager as the main payload and several other secondary payloads. The satellite was launched from Vandenberg Air Force Base on 23 February 1999 as a secondary payload on an American Delta II launch vehicle. The satellite incorporated a number of novel features for microsatellites at that time (it had the first push-broom imager on a microsatellite platform that achieved a 12-m resolution). The launch of Sunsat was significant from a legal perspective, because it was the first South African space object that was licensed under the Space Affairs Act. Following the successful launch of Sunsat, the University of Stellenbosch spun off a small company called SunSpace to commercialise the technology of SunSat.<sup>1</sup> This has necessarily been a very brief account of space activities in South Africa in the pre-2000 period. Readers interested in a more detailed account are referred to the papers by Alden [2] and Gottschalk [3].

## 3. The period 2000–2005: laying the foundations for policy development

The early 2000s saw a gradual resurgence of interest in space activities, this time driven by an appreciation of the societal benefits of space activities, rather than its military applications. At that time, the South African National Defence Force no longer had an active interest in developing independent space capabilities, so the

<sup>1</sup> However, the lack of a guiding policy meant that SunSpace operated in a kind of *ad hoc* policy environment that ultimately led to the demise of the enterprise in 2013. Although SunSpace was contracted to build the Sumbandila satellite for the Government in 2005, its international order book could not sustain its operation without the support of a dedicated national space programme. SunSpace was wound up in July 2013. The company's tangible assets, intellectual property and human capital were absorbed by the aerospace and defence company Denel Dynamics as a new Division, called SpaceTeq, which became operational on 1 July 2013. It is somewhat ironic that SpaceTeq was founded on the microsatellite-based heritage of SunSpace, given that in the 1980s Denel had been the prime contractor for the Greensat programme, which was building a satellite much larger than any satellite SunSpace ever built.

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