NRF Institutional Review 2010

FINAL SYNTHESIS REPORT

Review panel

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Reports on the reviews of the NRF clusters can be accessed at:

- Research and Innovation Support and Advancement
- Science advancement
- Nuclear sciences
- Astro-geosciences
- Biodiversity and environmental sciences
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Executive Summary

South Africa needs a vibrant independent research agency and is fortunate to have the NRF which is unique in Africa. The NRF has many strengths which enable it to play a leading role in delivering research outcomes and in the development of research capacity but the erosion of its autonomy and a range of other constraints (external and internal) are impacting on its effectiveness.

The strengths of the NRF include well developed governance principles and processes, well-established evaluation practices based on peer review and delivery of a broad range of programmes supporting and fostering research and the development of research capacity.

The NRF is to be commended for the development of strong governance practices, the on-going commitment to evaluation based on peer review and the critical role the NRF plays in the development of South African research capacity.

It is recognised that the NRF is a government agency that operates within the broad framework of government policy. However, the autonomy of NRF has been eroded by constraints on their decision making; “ring-fencing” of core funding and through the practice of new funding being allocated via a relatively large number of contracts with a concomitantly high administrative overhead. Together, these have impacted on both the efficiency and effectiveness of the NRF.

Recommendation 1:
Thus it is recommended that the NRF work with the DST to enable
(i) The NRF to maintain autonomy in selection decisions that involve academic merit and that should be informed by peer review;
(ii) The NRF to structure and plan the delivery of programs to maximise efficiency and effectiveness.

The NRF has made progress in the area of integration of its activities across the NRF but further work needs to be done in this area. The question of integration across the different NRF activities must also be considered on the basis of an evaluation of what should be its core activities. The Panel sees the funding of research and development as the core business of a research agency and other roles and tasks should be developed and refined with this in mind.

Recommendation 2:
The panel recommends that the NRF review its different activities and the extent to which they complement the core role of the NRF as a funding agency.

Recommendation 3:
That the NRF review a number of aspects of their organisation and management including:
(i) Undertaking a review of the distribution of costs amongst different activities to establish the cost of delivering the funding programmes and managing the national facilities;
(ii) Improvement and development of information and systems to facilitate strategic planning and oversight by the NRF Board and Senior Management.
(iii) Continuing to address human resource management and development.
All the Cluster Review reports highlighted the shortage of funding for research and the training of post-graduates. Irrespective, it is important that funding is efficiently utilised and targeted to individuals and institutions with the highest standards and potential (especially to deliver research training).

**Recommendation 4:**
The Panel strongly recommends an increase in the core funding of the NRF. If this is not possible or the increase is limited, the Panel recommends within the existing funding levels, funding could be administered and used more effectively if the NRF had a greater proportion of core funding to allow the NRF to plan a more cohesive set of programmes with greater potential impact.

The panel did not address the question of the balance of funding across disciplines in depth. It was noted in the report on RISA that the level of funding of the social science and humanities was in accordance with international norms.

**Recommendation 5:**
The Panel recommends that the Board of the NRF address the issue of the balance of funding across different disciplines as part of their on-going strategic planning.

Evaluation is an appropriate role for the NRF and the rating system has served South Africa well. However, the rating system could be broadened to take into account interdisciplinary research and new and emerging fields of research. Further, it is timely for the NRF to address the issue of rating individuals versus using a different unit of evaluation (e.g. discipline, department or research team).

**Recommendation 6:**
The Panel recommends that the NRF review best international practice in evaluation to determine if South Africa could effectively evaluate research training environments to target research training funding and opportunities to those disciplines and institutions that can undertake training most effectively.

The panel noted recent efforts to improve communication with stakeholders, nonetheless communication and consultation remain a problem for the NRF and needs on-going concerted attention.

**Recommendation 7:**
The Panel recommends that the NRF continue its recent efforts in communication with stakeholders and that a comprehensive communication strategy across all areas of the NRF be developed.

In a number of instances the panel noted the negative impact on the research community of the perceived high overhead cost for the research funding agency function of the NRF. It is recognised that the overhead as currently reported does not reflect the true cost of program delivery; however, it is possible this will still be high by international standards.

**Recommendation 8:**
The Review Panel strongly recommends that the NRF puts effort into a process that enables the correct distribution of the overheads and corporate costs across the programmes. This is important for the efficient distribution of administrative resources and for credibility among stakeholders and the matter should be addressed urgently.

It is appropriate for the NRF to manage National Facilities (NF) and the NRF’s role is in accordance with its Act. The NRF needs a strategy that takes into account lifecycle, differentiation and evolution of NFs. Certain activities within some NFs in relation to research is unclear (e.g. hospital and zoo) and needs to be addressed.

**Recommendation 9:**
The panel noted and supports the steps taken by the NRF to develop an approach to the management of the national facilities that takes into account the whole life-cycle of each facility.

**Recommendation 10:**
The panel further recommends as part of the overall strategy for managing national facilities that criteria be developed to assess the “fit” or appropriateness of each facility for NRF support within the context of the national research system.

The panel was informed about a proposed new model for the management of National Facilities that divided responsibility for science leadership from the management of the facilities. The Panel concurred with the view of a number of stakeholders that believe that it is difficult to separate science leadership from resource management and stresses the primacy of science leadership with appropriate backup by management systems.

**Recommendation 11:**
The Panel strongly recommends the primacy of science leadership so that the national facilities are directed by high quality, scientific leaders, supported by appropriate financial and management personnel and systems.

The Panel commends the DST and the NRF for foresight in ongoing investment in astronomy, which has placed astronomy in South Africa as a “jewel in the crown of African science”.

Given the huge investment and internationalisation of the Astro-Geosciences facilities and the scale of current and future activities in this area, it is not clear that the NRF can continue to manage these facilities without seriously distracting the NRF (or at least its Senior Management) from their primary functions as a funding agency.

**Recommendation 12:**
The Panel recommends that different arrangements be adopted for the management of the Astro-Geoscience facilities and that these NFs be managed by a new agency (or agencies).

The Synthesis Review Panel acknowledges the importance of science advancement in building a strong knowledge-based economy and the South African Agency for Science and Technology Advancement’s (SAASTA’s) accomplishments in this respect. However, SAASTA functions as a unit
largely independent of the NRF, and the DST and other government departments interact with them as a stand-alone agency. Most of their resources are specifically allocated through short-term contract funding from the DST

**Recommendation 13:**
The Panel recommends that the role and location of SAASTA be given consideration with some urgency.

Innovation relies on a strong research base and the NRF plays a critical role from fundamental through to applied research. This should be strengthened rather than diluting the effort across other agencies.

**Recommendation 14:**
The Panel recommends that THRIP remains within the NRF and that the NRF has a greater role in TIA to enhance the linkage across the value chain from fundamental research to commercialisation.

Alignment with national priorities and DST objectives is not always obvious and could be improved by investment that is more closely aligned to the priorities.

**Recommendation 15:**
That DST and NRF explore opportunities for the role of the NRF in support of the national system of innovation to be expanded by engagement with a broader range of government departments to deliver research outcomes in the national interest.

The NRF Board has emphasised the need for good governance but its role in strategic planning should be strengthened and underpinned by better information systems. An important role for members of the Board is to be influential advocates for the NRF.

**Recommendation 16:**
That the role of the NRF in strategic planning be strengthened and that the potential of candidates to be strong and influential advocates for the NRF be a consideration when appointments are made to the Board.

Follow-up of the recommendations of the 2005 review reports has been well documented. Although certain issues have been resolved there are many outstanding issues (especially in relation to communication and the role of the National Facilities).

The methodology utilised for the 2010 review of the NRF was appropriate. The involvement of eminent international reviewers was important and contributed to the development of the Clusters.
1 Background

Five years after being reviewed in 2004 (report published in 2005) the NRF has undergone a second review in 2010. The 2010 NRF Institutional Review was focussed on the delivery of the NRF entities against the NRF’s mandate and strategic objectives during the past five years (Terms of Reference, Appendix 1). For the purpose of the review the entities of the NRF were divided into the following 5 clusters:

1.1 Biodiversity and environmental cluster:
   - South African Institute for Aquatic Biodiversity (SAIAB)
   - South African Environmental Observation Network (SAEON)
   - National Zoological Gardens of South Africa (NZG)

1.2 Nuclear sciences cluster:
   - iThemba Laboratory for Accelerator Based Science (iThemba LABS)

1.3 Astro-geosciences cluster:
   - South African Astronomical Observatory (SAAO)
   - Hermanus Magnetic Observatory (HMO)
   - Haartebeesthoek Radio Astronomy (HartRAO)

1.4 Science advancement cluster:
   - South African Agency for Science and Technology Advancement (SAASTA)

1.5 Research and Innovation, Support and Advancement (RISA)

Each of the above clusters was reviewed by specialist Review Panels comprising 3-4 eminent scientists the majority of whom were from overseas foundations/laboratories (4 SA, 1 Africa, 11 Overseas). The Synthesis Review Panel studied the 5 Cluster Reports and recommends that these specialist reports and the various recommendations be examined and acted on by the Executive of the NRF and the Directors of the entities as appropriate. The Synthesis Review Panel considered the larger, generic issues in the reports and certain specific recommendations rather than coming to a conclusion on each issue and recommendation in each of the individual reports

1.1 The Purpose and Scope of the Review

The Synthesis Panel was requested to produce a synthesis report on the NRF as a single organisation based on the findings and recommendations of the cluster reviews to address the following:

- Integration of activities across the NRF
- Common structures across the NRF and their efficacy
- Strategic oversight across the NRF entities
- Approach for capacity building and science awareness across the NRF
• Appropriateness of the NRF as a funding agency as well as a research performer through its National Research Facilities.
• Any gaps that the NRF should be addressing in terms of the NRF Act within the National System of Innovation
• NRF’s alignment with the Ten-year Innovation Plan of the Department of Science and Technology

At a briefing meeting with members of the Review Reference Group the Panel was asked to address the following additional issues:

• Position of SAASTA within the NRF
• Methodology of the review process.

1.2 Review Process

In advance of meeting in Pretoria from the 5-9 December 2010, the Panel was supplied with all the relevant documentation required for the review (Appendix 1). As reflected in Appendix 2 the Panel had in depth discussions with the Review Reference Group, NRF Executive, Minister of Science and Technology, NRF Board, External Stakeholders, Managing Directors of the National Facilities (NF) and a Representative of the Department of Higher Education and Training (DHET). Given the volume of material available in the various submissions and responses, this report aims to draw out the major observations and recommendations rather than restating details available in this other material.

2. NRF Strengths

South Africa aims to transform its economy and society into a strong, knowledge-based economy. Such a development is dependent on the nation’s capacity to produce new knowledge and foster innovation. The National Research Foundation (NFR) plays a pivotal role in the country’s ability to achieve these goals. Those countries undertaking internationally-competitive science, technology and innovation require vibrant, independent research agency to ensure a flourishing research environment that nurtures talent and provides excellent facilities and research opportunities.

South Africa is fortunate to have the NRF, which is unique in Africa and has a vital role to play in contributing to the knowledge economy and national system of innovation (NSI). The NRF is strategically aligned with the NRF Act which states that its objective is “to support and promote research through funding, human resource development and the provision of the necessary research facilities in order to facilitate the creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge and thereby to contribute to the improvement of the quality of life of all the people of the Republic”.

The strength of the NRF governance structures and processes was highlighted in a number of Cluster Reviews and in many of the interviews conducted by the panel. Similarly, that selection and evaluation processes are underpinned by robust peer review and the commitment to quality and excellence is critical for the reputation and standing of the NRF both nationally and internationally. The NRF is supportive of research programmes, human capital development and international
cooperation. It is also sensitive to and supportive of the need for the development of research capacity (e.g. Thuthuka programme).

The NRF is to be commended for the development of strong governance practices, the on-going commitment to evaluation based on peer review and the critical role the NRF plays in the development of South African research capacity.

3. Autonomy

The Panel acknowledges that the NRF is a government agency charged with the administration of public funds and that it needs to work within a framework of government policy and accountability determined by the Minister of S&T. The Panel noted, however, a number of indicators of an erosion of independence and the blurring of the lines of responsibility for agency versus policy direction that gave it cause for concern. It is important that the roles of the three layers of the system involving the DST, NRF and research community are clarified to ensure that the NRF continues to enjoy the strong confidence of the research community.

The perceived erosion of independence has been manifested in several different ways.

(i) the research community is aware of, and very concerned about, government officials being involved in decisions that involve academic merit, which should be based on peer-review and the evaluation expertise of the NRF;

(ii) the “core grant” of the NRF which has historically provided research support on the basis of research excellence, has increasingly been “ring-fenced” for specific purposes; and

(iii) it appears that in recent years, increases in funding to the NRF from the DST have come primarily via contracts for specific purposes that have a high administrative overhead and often tight reporting and delivery timelines.

An example of the ring-fencing and high administrative overhead is the number of different Honours, Masters, PhD and Post-Doctoral bursaries/fellowships administered by the NRF. There are 16 categories of this group of bursaries/fellowships (NRF Bursary & Scholarship Values, Rules and Guidelines, 2010/11). In some cases the differences between the schemes are marginal and both the potential applicants and the agency would benefit from the scale and efficiencies achieved by integrating the objectives in each into larger schemes.

The Panel also noted the recent improvement in the working relations between the DST and NRF and supports these efforts, (e.g. the monthly strategic meetings to clarify roles and activities).

Recommendation 1:
That the NRF work with the DST to enable
(i) The NRF to maintain autonomy in selection decisions that involve academic merit and hence should be informed by peer review;

(ii) The NRF to structure and plan the delivery of programs to maximise efficiency and effectiveness.
4. Integration across the NRF

The NRF is a relatively young organisation and has in a few years been able to establish itself as a key institution in the NSI. The 2005 Review, the documents describing the status of follow-up activities, and the Cluster Reviews, all indicate that the NRF year by year is improving the oversight of its different activities. However, the Panel has the opinion that the NRF still has to aim at making further progress in this respect. The question of integration across the different NRF activities must also be considered on the basis of an evaluation of what should be its core activities. The Panel sees the funding of research and development as the core business for a research agency, and other roles and tasks should be developed and refined with this in mind. While the composition of activities varies amongst research councils in different countries, all have competitive research funding as a central role. The role of the NRF as a management agency for National Facilities, gives it a distinct role and a broader portfolio than many comparable research agencies. Therefore, it is a vital issue that the research funding functions are not compromised by other responsibilities, but rather can be used to complement and strengthen those activities.

The Panel did not have the opportunity to explore integration in depth. As we could observe it from the documents and interviews, not all activities within the NRF are well integrated. The National Facilities are operating as “semi-independent” organisations in some respects. SAASTA is in many respects operating as a standalone agency directly under contracts from the DST. The Cluster Reviews of the National Facilities (NFs) indicate that more should be done to develop these as true NFs open to the whole research community and to create synergies between activities of the NFs and NRF funding instruments. The panel notes that the NRF Executive has given substantial attention to the NFs in the past few years and supports this. Obviously, more can be achieved in this respect. The same can be argued about SAASTA. Its activities are closely connected to the Department of S&T, and the profile would have been more balanced if the NRF had greater autonomy. NRF might be at a crossroad in considering and deciding on the future location of SAASTA and some of the NFs.

Recommendation 2:
The panel recommends that the NRF review its different activities and the extent to which they complement the core role of the NRF as a funding agency. In particular, the panel recommends that the role and location of the South African Agency for Science and Technology Advancement (SAASTA) be given consideration with some urgency.

5. Ensuring Organisational Excellence

The NRF’s crucial role in the South African knowledge system puts heavy demands on the organisation and the RISA Review Report gives a number of important findings and recommendations in this regard. The report provides strong indications that there is still a need to give attention to staff stability, job satisfaction and gender balance. High turn-over of staff and also portfolio changes of existing staff on the NRF side increase operational risk and make it difficult to sustain relations. Developing internal NRF leadership potential is important as is training of new executives and managers.
Existing succession planning efforts should be strengthened to ensure greater continuity of leadership. Consideration should be given to secondments of staff from universities and other research institutions into strategic positions. Secondments of high profile researchers would enhance the visibility and stature of the NRF both nationally and internationally. In turn, it is important if such positions can be effected so that the individuals are not swamped by administrative responsibilities but have the capacity to undertake strategic activities and engage with the research community.

The NRF’s ICT capability and infrastructures are extremely important, both for customer satisfaction and for organisational excellence. Still, most stakeholder groups report on frustrating experiences regarding the NRF’s ICT systems, and the NRF should put more effort into establishing well-functioning systems.

The Panel noted with concern the lack of monitoring and data management systems to assist the NRF to make strategic decisions and account for the outcomes from NRF funding. It is beyond the scope of the review to recommend the exact nature of the management information system(s) required to achieve this, however, the panel did establish that the systems used within the higher education system (e.g. HEMIS) are unlikely to fit the NRF’s purposes. It is important for the NRF to be able to track the outputs from research grants and the progress and success of the various categories of bursars funded by the NRF.

**Recommendation 3:**
*That the NRF review a number of aspects of their organisation and management including:*

(i) Undertaking a review of the distribution of costs amongst different activities to establish the cost of delivering the funding programs and managing the national facilities;

(ii) Improvement and development of information and systems to facilitate strategic planning and oversight by the NRF Board and Senior Management.

(iii) Continuing to address human resource management and development.

**6. Funding**

All the Cluster Review Panels highlighted the issue of the shortage of funding for core research, development activities and National Facilities. This was reinforced during the various meetings of the Synthesis Review Panel. The lack of adequate funding for bursaries is discouraging capable students from embarking on post-graduate studies and is hampering the development of the next generation of researchers. The timing of awards of bursaries and scholarships was also noted as an issue that reduced take up rates of these awards and invariably results in potential students being lost from the system. The example given was that students were only informed in the March when they really need the notification before completion of the previous phase of their education.

It is not surprising that the review panel was provided with a number of anecdotal accounts of staff becoming disenchanted by the lack of available research funding. Senior, high performing researchers noted that the level of funding awarded on the basis of a high evaluation rating is much lower in both actual and real value compared to 10 or 20 years previously. Other examples included that of a productive, young researcher at a major South African university who has an outstanding,
world class record (publication in journals with an average impact factor of 5.4) not being funded by the NRF because “they have run out of funds”. This person will undoubtedly seek greener pastures and will be lost to South Africa. The potential for this talented academic to supervise PhD students is also negated due to the lack of funds for the students and their laboratory expenses. This scenario is replicated across the higher education system and the training of PhD students is compromised.

**Recommendation 4:**

The Panel strongly recommends an increase in the core funding of the NRF. If this is not possible or the increase is limited, the Panel recommends within the existing funding levels, funding could be administered and used more effectively if the NRF had a greater proportion of core funding to allow the NRF to plan a more cohesive set of programmes with greater potential impact.

If the core funding issue is not addressed, over time the numbers of future academic staff with adequate qualifications and experience will decline with a major adverse impact on South Africa’s ability to be globally competitive. The lack of modern research equipment in many areas also inhibits South Africa’s ability to do cutting edge research and retain staff who rely on such equipment. The Panel cannot overemphasise the importance of adequate research funding for training and attracting and retaining excellent staff at universities and research institutions.

On the issue of balance of support across disciplinary fields, the Panel noted that this is discussed in the RISA Panel Review Report. The RISA report builds on various studies undertaken since the last institutional review. They comment on the proportion of Social Science and Humanities (SSH), which they find in accordance with international norms.

**Recommendation 5:**

The Panel recommends that the Board of the NRF address the issue of the balance of funding across different disciplines as part of their on-going strategic planning.

7. **Differentiation**

The Panel notes that the mandate of the NRF involves internationally competitive science and the production of high-level human skills. The Panel noted that the challenges faced by the NRF in meeting the demand created by expansion of the higher education sector, and the need to build and retain research capacity without a substantial increase in base funding. Currently, the NRF has an evaluation function that rates individuals and directs some of its funding accordingly.

Support for research training and skills development may be enhanced if the NRF were to expand its evaluation function to include an evaluation of research training environments and/or research expertise within institutions in order to better direct funding for research training and including development programmes (e.g. Thuthuka). Such a “qualified differentiation approach” to supporting research and skills development has a number of international precedents.

**Recommendation 6:**

The Panel recommends that the NRF review best international practice in evaluation to determine if South Africa could effectively evaluate research training environments to target research training
funding and opportunities to those disciplines and institutions that can undertake training most effectively.

The Panel noted that the idea of differentiation is gaining momentum in South Africa. For example, the recent Consensus Report of the Academy of Science of South Africa, September 2010, on “An Evidence-Based Study on How to Meet the Demands for High-Level Skills in an Emerging Economy” noted on page 112 that “only a small number of universities generate more than 90% of all the PhDs in the country” and makes the recommendation to “target specific institutions with existing capacity and established track records for scaling up the production of PhDs even as selected programmes are funded within universities that are not strong overall in producing doctorates”.

8. Consultation and Communication

A strong theme throughout the Review, especially in the RISA Review, was consultation and communication which need to be strengthened. The Review commends RISA for its efforts to improve communication with its multiple stakeholders. Several measures are listed and clearly document that the NRF has given this strong priority.

Even so, in the words of the RISA Review, communication with stakeholders, especially the scientific community, must be improved. In spite of all the efforts, there remains a noticeable disconnect in perception between many sectors of stakeholders and that of the NRF. The research community asks for better consultation on developing and changing funding instruments, and better communication of funding opportunities.

The Panel acknowledge that consultation and communication are obviously a generic challenge for a research council. Every research council needs to build its operations on strong links with the research community and other stakeholders. At the same time it seems to be very hard to satisfy the stakeholders demand for insight in the council operations. But even if this is a challenging task for all research councils, communication must be improved substantially with emphasis on the important issues:

(i) how priorities, programmes and instruments emerge;
(ii) how decisions are taken on individual projects;
(iii) who is involved in decision-making; and
(iv) how conflicts of interest in panels are dealt with.

Recommendation 7:
The Panel recommends that the NRF continue its recent efforts in communication with stakeholders and that a comprehensive communication strategy across all areas of the NRF be developed.

9. Operational Overheads

The Panel noted with concern the high operational overheads highlighted in the RISA Panel Review Report (18% overhead for 2009, page 18). If these calculations were compared to other research councils (3-10% overhead), they indicate that the overhead is too high and clearly impacts negatively on the confidence of the research community. The Panel is aware that the calculation of the NRF
overhead includes a number of activities which normally would not be part of a research council’s tasks and that the calculation does not appropriately proportion the overhead across the programmes, facilities and other research-support activities. Accordingly it is not obvious what the correct figures are; however, it is likely that even when the costs of delivering the funding programs are rationalised they will still be high by international standards

**Recommendation 8:**
The Review Panel strongly recommends that the NRF puts effort into a process that enables the correct distribution of the overheads and corporate costs across the programmes. This is important for an efficient distribution of administrative resources and for credibility among stakeholders and the matter should be addressed urgently.


It is a distinctive element in the NRF’s portfolio to be the hosting agency for a number of NFs. The importance of NFs to serve the research community is recognised by the Panel and the NRF’s role is in accordance with its Act. However, the cluster reviews as well as other material, indicate that oversight of the NFs still is a major challenge. An overarching strategy for the NFs is needed that takes into account a life cycle approach, differentiation and evolution of NFs. The Panel recognises that strengthening of the management systems resulting in the financial stability of the NFs has been successfully achieved. The Panel also noted that oversight of the NFs occupies a significant proportion of the time available to the NRF leadership team.

**Recommendation 9:**
The panel noted the steps taken by the NRF to develop an approach to the management of the National Facilities that takes into account the whole life-cycle of each facility. The panel recommends that this approach be further developed and implemented.

The appropriateness of the activities within some of the NFs and their role in relation to research is unclear. To run a hospital and a zoo does seem to involve issues and challenges that might be outside the scope of a research council, even if we can understand the history behind this set up. This question needs to be addressed. Furthermore, the NRF should utilise funding instruments to ensure collaboration between NFs and the broader scientific community (e.g. training of PhD students). A national facility should serve this broader community and it might be significant that a Director of a NF was not aware of the availability of mobility grants to foster collaboration between NFs and universities.

**Recommendation 10:**
The panel further recommends as part of the overall strategy for managing National Facilities that criteria be developed to assess the “fit” or appropriateness of each facility within the context of the national research system.

The Panel noted in the Cluster Reviews and in a number of interviews that the NRF was proposing a new model for the management of the NFs which is interpreted as a separation of management of the facilities from scientific leadership. The leadership of the NRF indicated that some of the
concerns in the scientific community may stem from poor communication of this proposal rather than the detailed implementation of the proposal itself. However, the Panel has had sight of two documents by the Vice President, Research Infrastructure and National Research Facilities which indicate that the Director/Managing Director of a NF should be a recognised scientist with a MBA or MBL who is on a management career path and that the Chief Scientist, Chief Astronomer etc would report to the Director/Managing Director. It is not clear to the Panel how the NRF Executive views these issues, since we find some inconsistencies in the documents. The Panel is not convinced that it is possible to achieve strong scientific leadership without concomitant responsibility for the resources necessary to achieve the scientific goals. Based on their experience of research management and leadership, the Panel believes the proposed approach will detract from the ability of the facilities to attract and/or retain top scientists.

**Recommendation 11:**
*The Panel strongly recommends the primacy of science leadership so that the National Facilities are directed by high quality, scientific leaders, supported by appropriate financial and management personnel and systems.*

11. **Astro-Geosciences Facilities**

The Panel commends the DST and the NRF for foresight in ongoing investment in astronomy, which has placed astronomy in South Africa as a “jewel in the crown of African science” (SAAO Panel Review). The scale, scope, specialisation and international profile of the SKA, MeerKAT and SALT projects indicate the need for a specialised agency/agencies to manage these facilities. There is an opportunity cost to the NRF, given the level of management oversight required and arguably the NRF would be better placed without the burden of managing the Astro-Geosciences Facilities. During the week that the Panel was in Pretoria the Minister announced the formation of the South African National Space Agency which would incorporate HMO. The Panel is aware of discussions regarding the future management of the SAAO, MeerKAT/HartRAO, SALT and SKA and the Astro-Geosciences Review Panel’s recommendation to establish a South African National Astronomy Agency (SANAA). The Synthesis Review Panel supports the implementation of different arrangements to manage all the Astro-Geoscience Facilities. The scale of the SKA and the level of attention it requires from NRF management mean that both the NRF and the SKA project many benefit from separate arrangements. It is also clear that the NRF’s management of the recent controversy affecting the Director of the SAAO has adversely impacted on the reputation of the NRF amongst the international astronomy community. This in turn means the South African SKA bid may be better served by the separation.

**Recommendation 12:**
*The Panel recommends that different arrangements be adopted for the management of the Astro-Geoscience facilities and that these NFs be managed by a new agency (or agencies).*

12. **South African Agency for Science and Technology Advancement (SAASTA)**
Although SAASTA is not an independent NF and is part of RISA, it was formally reviewed as a Science Advancement Cluster. Communication and the promotion of the public understanding of science are important and the Science Advancement Panel noted the high quality of the work carried out by SAASTA. At the same time it came to the conclusion that the Science Advancement Cluster has no clear mandate.

SAASTA has articulated three areas of activity: Science Advancement, Science Education and Science Communication. The SAASTA Panel stated that there is an emphasis on science education at the expense of communication and engagement, owing to the fact that resources are specifically allocated through short-term contract funding from the DST. This skews the balance of activities and affects the ability of the organisation to perform at optimal level across the broad range of its strategic objectives. This is a core problem for SAASTA and must be addressed.

The Panel identified close collaboration with the NFs in communication efforts but it is still unclear how well SAASTA is showing leadership in its cross-cutting role. This gap should be addressed to clarify how the NFs and SAASTA work together to help it fulfil its mandate in this area.

If SAASTA is to fulfil its NRF role in promoting not only science education but also a broader understanding and uptake of the science research and innovation being conducted in South Africa, its resources must be spent much more strategically. In the final analysis the SAASTA Review Panel concluded that for SAASTA to continue the important work that it does particularly in science awareness and communication, it is important that it is at the cutting edge of science and thus location within the NRF is appropriate.

However the link between SAASTA and the NRF is remote. The Science Advancement Panel indicated that “SAASTA functions largely as a unit independent of the NRF and has its own buildings, website and newsletter that are separate from the NRF. Furthermore, the DST and other government departments interact with them as a stand-alone agency”.

The Synthesis Review Panel acknowledges the importance of science advancement in building a strong knowledge-based economy and SAASTA’s accomplishments in this respect. However, we see the need for further considerations of the location of SAASTA as part of NRF. The Panel does not support the Science Advancement Review Panel’s recommendation of a separate Vice President or NF status within the NRF. Since DST is the major user of SAASTA the Panel recommends that DST considers the future location of SAASTA within the science system but not necessarily as a separate agency. An important part of such a consideration should be if SAASTA is part of the NRF then the benefit to the NRF in its role as a strong and integrated science funding agency must be articulated.

**Recommendation 13:**

*The Panel recommends that the role and location of SAASTA be given consideration with some urgency.*

**13. Role of the NRF within the NSI**
Innovation relies on a strong research base and the NRF has a critical role to play in developing research capacity across the whole system from fundamental through to applied research. This role should be strengthened rather than diluting the effort across other agencies. The Panel considers that THRIP, which is a vital instrument in bringing together HEIs and industry partners, continues within the NRF. The Panel heard one view that the programme could reside within the Department of Trade and Industry but the Panel thought this would be a retrograde step and could harm the important linkage between fundamental and applied research which is essential for a vibrant NSI system. Similarly, the NRF has the capacity to play a greater role in TIA to enhance the linkage across the value chain from fundamental research to commercialisation. It is important to remember that it is often discovery or fundamental research that underpins major commercial successes. The modern molecular biotechnology industry which developed from two scientists studying the way a harmless, non-industrial bacterium defended itself from being attacked by bacterial viruses is just one example of how fundamental research with no evidence of industrial application resulted in the discovery of restriction enzymes. These enzymes cut DNA in a unique way which enables DNA molecules from diverse origins to be rejoined.

**Recommendation 14:**

*The Panel recommends that THRIP remains within the NRF and that the NRF has a greater role in TIA to enhance the linkage across the value chain from fundamental research to commercialisation.*

The NRF’s role in the National System of Innovation can be enlarged by consciously developing a broader role in relation to government departments. The NRF has quality processes and systems in place that could be more broadly utilised by government departments to deliver research platforms and programmes. The NRF can also play an important role in coordinating government departments’ funding for research and higher education as well as using funding instruments to foster networking across the higher education sector. The resourcing of library data banks (current and future) should be coordinated with the DHET and ASSAf to address the need for national licences (with new funding).

**14. Alignment with Ten-Year Innovation Plan**

The Synthesis Panel is asked in the Terms of Reference to consider the NRF’s alignment with the Ten-Year Innovation Plan. The Panel notes that the OECD (2010) report did find insufficient linkage in general between innovation policy and implementation. We are also informed that the Ten-Year Innovation Plan was published without much consultation with the research system and its key actors. This indicates a weak linkage between innovation policy, research policy and funding. Even if we build on weak information regarding this issue, the Panel observes that the NRF’s alignment with national priorities and DST’s objectives is not always obvious. This observation is in line with the weak relationship between research policy and innovation policy. The NRF’s performance could be improved by investment that is more closely aligned to the national priorities. It is important to realise, however, that this should not mean further ring-fencing of existing funds from DST. The Panel is of the opinion that a broader role in the NSI, and better alignment with the Ten-Year Innovation Plan, would require the mobilisation of funding across different government departments. Were the NRF to succeed in securing funding via such an approach, it should also
mean that the NRF would be offered a more central, consultative role in the formation of innovation policy.

**Recommendation 15:**
*That DST and the NRF explore opportunities for the role of the NRF in support of the national system of innovation to be expanded by engagement with a broader range of government departments to deliver research outcomes in the national interest.*

15. **Evaluation**

The NRF pioneered the introduction of a rating system for individual researchers in the early 1980’s and South Africa was the first country to rate scientists. The Panel considers that evaluation is an appropriate role for the NRF. The evaluation role enhances the ability of the NRF to play a leading coordination role with government departments funding research and education. Since any rating system will not please everyone, criticism of the rating system is inevitable and must be managed. The type of feedback to those scientists that do not qualify or are rated below their expectations is particularly important.

The rating system involving individuals has not changed since it was introduced nearly 30 years ago and the Panel recommends that the rating system should be broadened to take into account interdisciplinary research and new and emerging fields of research. **Recommendation 6** suggests that the NRF review best international practices in research evaluation, for example the evaluation of disciplines and university departments to provide support of research in the most appropriate environments.

A problem with the present rating system is the discrepancy between the rating outcome and reward versus the effort and anxiety in submitting an application, resulting in the loss of credibility of the process and researchers opting out of being rated.

16. **NRF Board**

The NRF Board has emphasised the need for good governance and has made significant progress in this regard. However, its role in strategic planning should be strengthened and underpinned by better information systems (see section 4). The panel also emphasises the importance of the role of the Board to be influential advocates for the NRF. This should be taken into account in making new appointments to the Board.

**Recommendation 15:**
*That the role of the NRF in strategic planning be strengthened and that the potential of candidates to be strong and influential advocates for the NRF be a consideration when appointments are made to the Board.*

17. **Progress in Implementing Recommendations of the 2005 NRF Review**
The follow-up of the recommendations of the previous review reports has been well documented (e.g. Recommendations from the 2005 NRF Institutional Review – Progress Report, November 2009; NRF Response to the Recommendations of the 2004/05 NRF Review, September 2010). These documents present a message of a strong and systematic approach to further develop the NRF to serve the scientific community. The Panel acknowledges this and commends the professional approach and efforts. There has been substantial progress regarding many issues and some have been resolved. But at the same time there are some significant outstanding issues, some of which we have highlighted in the Panel’s report.

18. Methodology of the Review

The Panel supports the methodology utilised for the 2010 review of the NRF. The involvement of high-level international reviewers was important and contributed to the development of the Clusters. However, by having predominantly subject specialists as part of the Cluster Review Panels, advocacy was sometimes apparent, rather than a strategic view. The Panel recommends that members of the NRF Executive should not be part of the Review Reference Group. The role of Executive Management and heads of the NFs in responding to the review reports was not clear and variously interpreted. The Panel recommends an integrated response in future reviews. Regular reviews of the NFs should be ongoing and feed into the next five-year reviews. The support of an experienced external scribe during the Synthesis Review was invaluable.

19. Acknowledgements

- The NRF Board and Executive for their open and willing participation.
- Prof. Cheryl de la Rey for her role as chair of the Review Reference Group and for her hospitality.
- Anke Radel, Makhupu Selepe and Millicent Motheogane for excellent support.
- Robyn Arnold and Heather Erasmus for outstanding assistance.
TERM OF REFERENCE

INSTITUTIONAL REVIEW OF THE NATIONAL RESEARCH FOUNDATION

2010

1. Assignment title

Institutional Review of the National Research Foundation (NRF) covering the period 2004 to 2009.

2. Background

Science Councils in South Africa are to be reviewed at five-year intervals. The NRF, which was commissioned on 1 April 1999, experienced one institutional review in 2004, the report of which was published in 2005. This review consisted of a number of specific and in-depth business unit reviews besides the overall integrated review of the NRF. Business units that were reviewed included the South African Astronomical Observatory (SAAO), Hermanus Magnetic Observatory (HMO), Hartebeesthoek Radio Astronomy Observatory (HartRAO), iThemba Laboratory for Accelerator Based Science (iThemba LABS) and the South African Institute for Aquatic Biodiversity (SAIAB).

The second NRF Institutional Review will be focused on the delivery of the NRF entities against the NRF’s mandate and strategic objectives during the past five years.

3. Assignment Principal and Review Reference Group

The Assignment Principal is the Board of the NRF. To facilitate matters the Board will be appointing its representative to act as Assignment Principal for operational matters from the staff of the NRF Research and Innovation, Support and Advancement (RISA).

The Review Reference Group (RRG) comprises the two Vice-Presidents of the NRF and five members appointed by the Assignment Principal.

The role of the RRG is to

• approve the terms of reference (ToR);
• approve the review plan from the review management service provider;
• recommend the budget developed by the review management service provider;
• identify/approve the review panels for the five clusters;
• consider and suggest suitable interviewees for the review panels;
• accept the final report from the review panels and the respective responses of the management of the NRF entities as well as the overall NRF management response;
• take responsibility for briefing the working group that will write a synthesis review report on the NRF as a single organisation;
• provide comments and recommendations on the review process and the extent to which the ToR for the review have been addressed;
• meet under the direction of the Chair of the RRG, as required.

The Assignment Principal will

• appoint the members of the RRG;
• consider the following before they are forwarded to the DST by the Review Technical Committee:
the final report by the review panels;
- the response of the management of the NRF entities and the overall NRF Management response; as well as
- the comments and recommendations by the Review Reference Group on the review process and the extent to which the terms of reference for the review have been addressed.

4. Review management service provider

The Monitoring and Evaluation (M&E) unit of the NRF will act as the service provider to manage the review process. The responsibilities of the M&E unit will be to:

- develop a proposal for the review exercise, including a budget;
- develop the ToR for the review;
- prepare the letters of invitation for the approved members of the review panels for the Assignment Principal’s signature and distribution;
- develop a programme for the review;
- manage, coordinate and administer the entire review process, including logistics for the reviewers and the on-site review programme of Research and Innovation, Support and Advancement (RISA). (For the other NRF entities please note Item 8.4 of the ToR: All arrangements for the on-site programmes including the logistical arrangements for the interviewees invited to interact with the reviewers will be made by the NRF entity to be reviewed.)
- provide support to the review panels;
- source the necessary documents stipulated in the Annexure with the help of the staff of the NRF entities concerned and make them available to the review panels at least four weeks prior to the commencement of the respective reviews in South Africa;
- receive the preliminary and final reports by the review panels and submit them to the Assignment Principal for further action;
- forward the preliminary and final reports by the review panels to the RRG for acceptance;
- place the final review reports on the NRF website as soon as possible after acceptance of the review reports by the NRF Board.

5. The purpose of the review

The purpose of the review will be to provide:

- a retrospective view on the performance of the NRF in terms of
  - the mandate stated in the NRF Act (Number 23 of 1998), as well as
  - the strategic objectives of the NRF;
- an assessment of the management effectiveness of the NRF in terms of resource allocation in support of strategic objectives;
- critical views on possible gaps not addressed by the NRF in terms of the NRF Act within the National System of Innovation;
- recommendations regarding the future strategic direction and operational execution of the NRF mandate.

6. The scope of the review

The review will cover the past five financial years, i.e. 1 April 2004 up to 31 March 2009 and will cover the NRF grouped into the five clusters given below. In addition, the review will generate a synthesized review report on the NRF as a single organisation. In conducting the review the panels should, where possible, take into account the recommendations of previous relevant reviews and assessments of NRF activities.

6.1 Biodiversity and environmental cluster:
- South African Institute for Aquatic Biodiversity (SAIAB)
- South African Environmental Observation Network (SAEON)
- National Zoological Gardens of South Africa (NZG)

6.2 Nuclear sciences cluster:
• iThemba Laboratory for Accelerator Based Science (iThemba LABS)

6.3 Astro-geosciences cluster:
• South African Astronomical Observatory (SAAO)
• Hermanus Magnetic Observatory (HMO)
• Hartebeesthoek Radio Astronomy Observatory (HartRAO)

6.4 Science Advancement cluster:
• South African Agency for Science and Technology Advancement (SAASTA)
• Science advancement activities of all the NRF entities to be reviewed (see items 6.1 to 6.5)

6.5 Research and Innovation, Support and Advancement (RISA)

7. Review dimensions

7.1 The reviewers are requested to determine the strengths, weaknesses and impact of the NRF entities in their cluster in terms of their contribution towards the NRF objectives applicable during the period 2004 to 2009 as stipulated in Annexure 1.

7.2 In addition, the reviewers are also requested to provide for the NRF entities in their respective cluster:

7.2.1 their critical views on the success of the science advancement endeavours. The findings and recommendations of the cluster reviews will feed into the review of the Science Advancement cluster;

7.2.2 an assessment of the management effectiveness in terms of resource allocation in support of strategic objectives; and

7.2.3 their views on possible gaps not addressed in terms of the NRF Act;

7.2.4 recommendations regarding the future strategic direction and operational execution of the NRF mandate;

7.2.5 any information that could assist the working group members who will be compiling the synthesis report to address their brief (see Item 7.3 below).

7.3 A separate working group will be requested to compile a synthesis report on the NRF as a single organisation based on the findings and recommendations of the cluster reviews to address the following:

• Integration of activities across the NRF
• Common structures across the NRF and their efficacy
• Strategic oversight across the NRF entities
• Approach for capacity building and science awareness across the NRF
• Appropriateness of allocation of resources across NRF entities/disciplines
• Appropriateness of the NRF as an agency function as well as a research performer through its National Research facilities
• Any gaps that the NRF should be addressing in terms of the NRF Act within the National System of Innovation
• NRF’s alignment with the Ten-year Innovation Plan of the Department of Science and Technology.
8. The review structure and process

8.1 A panel consisting of at least two members with appropriate experience and skills to conduct the reviews will be appointed for the review of each of the five clusters. At least one of the reviewers on each panel should be from abroad. Since this review will not be an in-depth review of the scientific activities of the facilities, the reviewers need not be scientific experts in the fields covered by the facilities but should be knowledgeable on the broad areas of their respective cluster.

8.2 A working group comprising two experts will be appointed to compile a synthesis review report on the NRF as a single organisation. The latter will be done under the guidance of the Review Reference Group. This working group will consolidate the findings and recommendations of the five cluster reviews and will also address Item 7.3 above.

8.3 The reviewers will base their findings on the respective self-evaluation reports by the entities of the respective clusters as well as other relevant documents. In addition, each panel will be conducting interviews with the management of the entities in their respective clusters and their most important stakeholders. Each panel will be expected to compile a review report including its findings and recommendations.

8.4 The logistical arrangements for the reviewers will be made by NRF M&E unit staff members. All arrangements for the on-site programmes including the logistical arrangements for the interviewees invited to interact with the reviewers will be made by the NRF entity to be reviewed. NRF M&E unit staff will only make arrangements for the on-site programme for the review of RISA and the review at Corporate level.

8.5 The NRF M&E unit will draw up a programme for each review in consultation with the RRG and the management of the NRF entity/entities concerned. The panels will have the opportunity to interrogate the proposed programmes and to recommend amendments and additions should the need arise.

8.6 The panels will have the opportunity to interview members of the NRF Board, management of the respective NRF entities in their cluster as well as other relevant stakeholders from government, industry and the Higher Education Sector, recipients of research grants, student beneficiaries, users of the NRF Facilities, users of research supported by the NRF, etc.

8.7 The resource documents for the review listed in the Annexure will be made available to the panels four weeks in advance of the commencement of the reviews.

8.8 The review panels will decide on and pursue their own line of questioning during interviews.
9. **Deliverables by**

9.1 **Management of the NRF entities to be reviewed**

9.1.1 Self-evaluation reports compiled by the management of each NRF entity for transmission to the review panels at least eight weeks prior to the commencement of the on-site review programme in South Africa. The reports should address the review dimensions listed under Items 7.1 to 7.2 above (and Items 7.1 to 7.3 in the case of the NRF overall self-evaluation report) and should cover the period 1 April 2004 up to 31 March 2009. Concise information on the funds received by the NRF entity (including all sources in the NRF) and international sources per year for the period under review should also be included. The reports should be supported by relevant statistics/figures, should focus on outputs and should not exceed 40 pages with annexures.

9.1.2 **List of stakeholders**

Appointments/discussions with stakeholders will be arranged for the review panels to facilitate their tasks. It would be helpful, if the names could be clustered under the headings NRF Board members, management of the respective NRF entities, stakeholders from government, industry and the Higher Education Sector, recipients of research grants, student beneficiaries, users of the NRF Facilities, and users of research supported by the NRF. It would also be beneficial if the names of the critically important stakeholders are highlighted or appear in bold.

9.1.3 **List of documents considered to be essential reading for the review panels and other documentation which should be accessible to reviewers during the review.** Documents listed on Annexure 2 to the ToR for the review which are not in the public domain are to be supplied to the Service Provider for onward transmission to the review panels six weeks in advance of the commencement of the reviewers’ on-site programmes in South Africa.

9.1.4 **Names, affiliations and contact details of possible reviewers for consideration.**

9.1.5 **Written responses from the management of the NRF entity reviewed to the final review reports within two weeks after receipt of the reports.**

9.2 **Review panels**

9.2.1 Verbal feedback on completion of the on-site reviews to members of the Review Reference Group, the NRF Executive/management and senior officials of the DST;

9.2.2 Preliminary reports on completion of the stakeholder interviews;

9.2.3 Final reports within two weeks of completion of the stakeholder interviews. The reports should include:
- an executive summary;
- background to the review;
- evaluation questions that were addressed;
- key findings;
- recommendations;
- conclusions;
- appendices containing, e.g. ToR, persons interviewed.

9.3 **Review Reference Group**

Comments and recommendations by the Review Reference Group on the review process and the extent to which the ToR for the review have been addressed within two weeks after receipt of the final report.

10. **Time frame**
Preparations for the review will commence in 2009 but the programmes involving the reviewers will take place in 2010 depending on the availability of suitable reviewers. It is acknowledged that, ideally, the review should be concluded prior to the commencement of the Soccer World Cup in June 2010.

11. Budget

The NRF M&E unit will submit a budget for the review to the Review Reference Group for recommendation and to the NRF Executive for payment.

*The ToR may be amended should the need arise.*

__________________________
Chair of Review Reference Group
__________________________
Assignment Principal

__________________________
Member of NRF Board on
Review Reference Group

__________________________
Date

__________________________
Date
Annexure 1

OBJECTIVES OF THE NATIONAL RESEARCH FOUNDATION

2004 TO 2009

2004

In 2004 the corporate core missions of the NRF were to develop and support:

- High-quality human resources in aggressively increasing quantities;
- The generation of high-quality knowledge in prioritised areas that are responsive to national and continental development needs;
- The utilisation of knowledge, technology transfer and innovation to ensure tangible benefits to society from the knowledge created;
- The provision of state-of-the-art research infrastructure that is essential to facilitating the development of high-quality human resources and knowledge.

The NRF also had six cross-cutting corporate strategic priorities, i.e.

- Redressing and ensuring equity in race and gender;
- Adhering to quality;
- Internationalising research;
- Focusing on Africa;
- Positioning the NRF within the National System of Innovation;
- Transforming the NRF organisationally.

2008

In 2008 the NRF drafted a new strategic plan called NRF Vision 2015 with the following strategic objectives which are to guide the NRF over the next couple of years, i.e. to

- promote internationally competitive research as basis for a knowledge economy;
- grow a representative science and technology workforce in South Africa;
- operate world-class evaluation and grant-making systems;
- provide cutting-edge research, technology and innovation platforms;
- contribute to a vibrant national innovation system.

From the above it is apparent that the 2004 objectives largely fed into the new objectives.
DOCUMENTS FOR THE REVIEW PANELS

1. GENERAL (FOR ALL PANELS)

1.1 Essential reading
- NRF Act (Number 23 of 1998)
- NRF Annual Report 2008/9
- NRF KPI (key performance indicator) Report 2009
- NRF Business Plan 2004/05 – 2006/07
- NRF Business Plan 2006/07 – 2008/09
- NRF stakeholder perception survey report 2010
- South Africa’s National Research and Development Strategy
- Strategic Plan of the NRF – NRF Vision 2015

1.2 Additional reading
- NRF Business Plan 2010/13
- Human Capital and the South African Knowledgebase
- NRF Annual Report 2004/05
- NRF Annual Report 2005/06
- NRF Annual Report 2006/07
- NRF Annual Report 2007/08
- OECD report on the National System of Innovation in South Africa
- Report on Institutional NRF Review 2004
- Ten-year Innovation Plan of the Department of Science and Technology
- White Paper on Science and Technology, 1997

2. GENERAL DOCUMENTS SPECIFIC TO NRF CLUSTERS

Essential reading for reviews of
- Astro-geosciences cluster
- Biodiversity and environmental cluster
- Nuclear sciences cluster
- Report on 1997 Review on the National Facilities

3. DOCUMENTS SPECIFIC TO INDIVIDUAL NRF CLUSTERS

3.1 BIODIVERSITY AND ENVIRONMENTAL CLUSTER

3.1.1 South African Institute for Aquatic Biodiversity (SAIAB)

Essential reading
- Self-evaluation report by the South African Institute for Aquatic Biodiversity
- SAIAB Science Plan
- Annual Research Reports 2004-2008
- Annual Highlights Reports 2004-2009
- Report on review of SAIAB, 2004
- Report on review of African Coelacanth Ecosystem Programme (ACEP), 2005
- Establishing a basis for ecosystem management- SAJS _ Vousden et al 2008

Additional reading
- Digital Specimen Curation at SAIAB
- SAIAB Management Response document to 2004 Review
- ACEP Self-assessment report 2005
- Education Highlights newsletter 2008-09
- CHERTYL Evaluation of Bright Sparks
3.1.2 South African Environmental Observation Network (SAEON)

Essential reading
- Self-evaluation report by SAEON
- SAEON Core Science Framework, TG O’Connor et al, 2009

Additional reading
- Design of the South African Environmental Observation Network (SAEON), SAEON Technical Steering Committee, 2004
- Environmental Observatories: LTER à la Afrique, J Henschel & J Pauw 2005
- SAEON Review, SAEON Management, 2004
- SAEON Environmental Science Education Outreach Programme Evaluation Report, R Pillay, 2007

3.1.3 National Zoological Gardens (NZG)

Essential reading
- Self-evaluation report by the NZG
- Report on the review of the NZG of South Africa
- Agenda 2015
- The World Association of Zoos and Aquaria Conservation Strategy
- The National Environmental Management & Biodiversity Act

Additional reading
- The government gazette declaring the NZG a National Facility
- A strategy to transform NZG into a National Facility

3.2 NUCLEAR SCIENCES CLUSTER (iThemba Laboratory for Accelerator Based Science)

Essential reading
- Self-evaluation report by the iThemba Laboratory for Accelerator Based Science (iThemba LABS)
- Business Plan iThemba LABS 2004/05
- Business Plan iThemba LABS 2005/06
- Business Plan iThemba LABS 2006/07
- Business Plan iThemba LABS 2007/08
- Business Plan iThemba LABS 2008/09
- iThemba LABS Strategic Plan 2005/06 – 2009/10
- 5-Year Research Plan (2008 – 2012) iThemba LABS (Gauteng)
- 5-Year Research Plan iThemba LABS (Materials Research Group), 12 October 2002
- 5-Year Research Plan iThemba LABS (Physics Group)
- 5-Year Research Plan iThemba LABS Radionuclide Group
- Report on review of iThemba LABS, 2004
3.3 ASTRO-GEOSCIENCES CLUSTER

Essential reading
- Report on the review of the South African Astro-Geosciences facilities of the NRF, 2004

3.3.1 South African Astronomical Observatory (SAAO)

Essential reading
- Self-evaluation report by the South African Astronomical Observatory
- Business plan 2004/2005
- Business plan 2005/2006

Additional reading
- Annual report 2004/2005

3.3.2 Hermanus Magnetic Observatory (HMO)

- Self-evaluation report by the Hermanus Magnetic Observatory
- Proposal for an HMO Flagship Project Ihlabathi: Core to Space
- International Stakeholder Comments [to above]
- HMO Vision 2015

3.3.3 Hartebeesthoek Radio Astronomy Observatory (HartRAO)

Essential reading
- Self-evaluation report by the Hartebeesthoek Radio Astronomy Observatory
- Business plan 2006/2009
- Business plan 2007/08 – 2009/10
- Business plan 2008-2010

Additional reading
- Annual report 2006/2007 (track changes)
- Annual report 2007/2008
- Websites of the Very Long Baseline Interferometry (VLBI)

3.4 SCIENCE ADVANCEMENT CLUSTER

3.4.1 South African Agency for Science and Technology Advancement (SAASTA)

- Report into the Johannesburg Observatory & Related Science Centres & Science Outreach Programmes, Totem Media
- Youth into Science Strategy
- SAASTA Business Plan 09/10
- Unearthing Tomorrow's SET Leaders, The Impact of SAASTA's National Science Olympiad (SAASTA CBT Content)
- SAASTA Brochure

3.4.2 Science advancement activities of other NRF clusters to be reviewed

- Sections on science advancement in reports on reviews of NRF clusters, i.e.
  - Nuclear sciences cluster
  - Astro-geosciences cluster
  - Research and Innovation, Support and Advancement
  - Biodiversity and environmental sciences cluster
  - Science Advancement cluster
3.5 RESEARCH AND INNOVATION, SUPPORT AND ADVANCEMENT (RISA)

Essential reading
- Self-evaluation report by RISA
- Promoting Quality Research: An evaluation of the peer-review system used for grant-making as managed by the South African National Research Foundation
- Report on review of the DST/NRF Centre of Excellence Programme

Additional reading
- Reports on reviews of seven DST/NRF Centres of Excellence (CoE) in 2009, i.e.
  - DST/NRF CoE for Biomedical TB Research
  - DST/NRF CoE in Birds as Keys to Biodiversity Conservation
  - DST/NRF CoE for Invasion Biology
  - DST/NRF CoE in Tree Health Biotechnology
  - DST/NRF CoE in Catalysis
  - DST/NRF CoE in Strong Materials
  - DST/NRF CoE in Epidemiological Modelling and Analysis
- Reports on 2007 Higher Education South Africa Review of the NRF evaluation and rating system, i.e.
  - An historical review and analysis of the rating system, 2007. (SC Krige and Ms P Morrell)
  - Mapping the formal and informal use of the rating system over time by various institutions, 2007. (CL Lombard)
  - Impact of the NRF evaluation and rating system – A review, 2007. (HC Marais)
  - The NRF evaluation and rating system in the world context, 2007. (A Pouris)
  - Review of the processes used to manage the rating of Individual Researchers, 2007. (M Madikizela)

4. DOCUMENTS SPECIFIC TO COMPILATION OF SYNTHESIS REPORT ON NRF AS A SINGLE ORGANISATION

Essential reading
- NRF response to the recommendations of the 2004/05 NRF review, September 2010
- Reports on reviews of five NRF clusters, i.e.
  - Nuclear sciences cluster
  - Astro-geosciences cluster
  - Research and Innovation, Support and Advancement
  - Biodiversity and environmental sciences cluster
  - Science Advancement cluster
- Management responses to review reports from:
  - iThemba Laboratory for Accelerator Based Science
  - Hartebeesthoek Radio Astronomy Observatory
  - Hermanus Magnetic Observatory
  - South African Astronomical Observatory
  - Research and Innovation, Support and Advancement
  - South African Environmental Observation Network
  - South African Institute for Aquatic Biodiversity
  - National Zoological Gardens of South Africa
  - South African Agency for Science and Technology Advancement

Additional reading
- Self-evaluation reports by:
  - iThemba Laboratory for Accelerator Based Science
- Hartebeesthoek Radio Astronomy Observatory
- Hermanus Magnetic Observatory
- South African Astronomical Observatory
- Research and Innovation, Support and Advancement
- South African Environmental Observation Network
- South African Institute for Aquatic Biodiversity
- National Zoological Gardens of South Africa
- South African Agency for Science and Technology Advancement
Appendix 2

STAKEHOLDERS INTERVIEWED

Department of Science and Technology
Mr Martin Mulcahy  Special Advisor to the Minister
Mrs Naledi Pandor  Minister of Science and Technology
Dr Molapo Qhobela  Deputy Director-General: Human Capital and Knowledge Systems

National Research Foundation Board
Prof Belinda Bozzoli  Deputy Vice-Chancellor, University of the Witwatersrand and Chair of NRF Board
Prof Johannes W Fedderke  (by teleconference)
Prof Venitha Pillay  University of Pretoria
Ms Tryphosa Ramona  Group-Chief Financial Officer, Whiphold

Review Reference Group (RRG)
Prof Cheryl de la Rey  Chair of RRG, Vice-Chancellor and Principal, University of Pretoria
Prof Sunil Maharaj  Head: School of Mathematical Sciences, University of KwaZulu-Natal
Prof Tebello Nyokong  Dept of Chemistry, Rhodes University (and member of NRF Board)

External stakeholders
Prof Krish Bharuth Ram  Head, National Advisory Council on Innovation
Mr Ahmed Essop  Chief Executive Officer, Council on Higher Education
Prof Maggi J Linington  Executive Dean: College of Agriculture and Environmental Sciences, University of South Africa
Dr Sandile Malinga  Caretaker CEO, South African National Space Agency
Ms Kirti Menon  Acting Deputy Director-General, Department of Higher Education and Training (by teleconference)
Prof Loyiso Nongxa  Vice Chancellor, University of the Witwatersrand and Co-Chair of HESA (Higher Education South Africa) Research and Innovation Strategy Group
Mr Peter Pedlar  Deputy CEO: Operations and Capacity Enhancement, Human Sciences Research Council
Dr Bethuel Sehlapeloe  Chair: THRIP Board
Dr S Sibisi  CEO, CSIR

National Research Foundation
Dr Gatsha Mazithulela  Vice-President: Research Infrastructure and National Research Facilities
Dr Dorsamny (Gansen) Pillay  Vice-President and Managing Director: Research and Innovation Support and Advancement
Mr Bishen Singh  Group Executive: Finance and Business Systems
Dr Albert van Jaarsveld  President and CEO

Managing Directors of NRF facilities/entities and NRF Executive Directors
Prof Phil Charles  Managing Director, South African Astronomical Observatory (by teleconference)
Ms Beverley Damonse  Managing Director, South African Agency for Science and Technology Advancement (by teleconference)
Dr Gansen Pillay  Vice-President and Managing Director: Research and Innovation Support and Advancement
Dr Zeblon Vilakazi  Managing Director, iThemba Laboratory for Accelerator Based Science