Institutional Review of the National Research Foundation (NRF)

REPORT

February 2005
Institutional Review of the National Research Foundation

03 to 14 February 2005

REPORT

Institutional Review Panel:

Prof Susan Cozzens
Director: Technology Policy and Assessment Centre,
School of Public Policy,
Georgia Institute of Technology,
Atlanta, USA

Prof Wieland Gevers (Convenor)
Executive Officer: Academy of Science of South Africa.

Ms Mpho Letlape
Managing Director: Human Resources,
ESKOM, South Africa.

Prof Cora Marrett
Senior Vice-President: Academic Affairs,
University of Wisconsin
Madison, USA.

Prof Deborah Posel
Director: Wits Institute for Social and Economic Research,
University of the Witwatersrand
Johannesburg, South Africa.

Dr Colin Webb
Group Manager: Strategy and Research,
Tertiary Education Commission
Wellington, New Zealand.
# TABLE OF CONTENTS

**EXECUTIVE SUMMARY**

**RANKED PRINCIPAL RECOMMENDATIONS**

1. **INTRODUCTION**
   - 1.1 Purpose and scope
   - 1.2 Process of the review
   - 1.3 The evidence base of the review
   - 1.4 Outline of the report

2. **THE GENERAL OPERATING ENVIRONMENT OF THE NRF, MISSIONS, GOVERNANCE AND STAKEHOLDER RELATIONSHIPS**
   - 2.1 Positioning the NRF
   - 2.2 National goals
   - 2.3 NRF mandate, missions and impact
   - 2.4 Governance
     - 2.4.1 The NRF Board
     - 2.4.2 Relationship with the DST
     - 2.4.3 Relationship with the DoE
   - 2.5 The NRF’s stakeholders
     - 2.5.1 Who are the NRF’s stakeholders?
     - 2.5.2 Relationships with stakeholders

3. **NRF FUNDING PROGRAMMES AND THE NATIONAL RESEARCH FACILITIES**
   - 3.1 General issues across all funds
     - 3.1.1 Purpose of funds and implementation
     - 3.1.2 Co-ordination of time-lines and customization of service
     - 3.1.3 Composition of panels
     - 3.1.4 Transparency
3.1.5. Timeliness, responsiveness and accuracy 40
3.1.6. Feedback 41
3.1.7. Transaction costs 41
3.1.8. Synergies among funds 42

3.2 Management of the Focus Area Programmes 43
3.2.1 Disciplinary mix 43
3.2.2 The mix of basic and applied sciences 44
3.2.3 The mix of research in relation to national goals 44
3.2.4 Costing issues 45
3.2.5 Reporting 46
3.2.6 The level of funding of the parliamentary core grant to RSA 46

3.3 Other funds 47
3.3.1 The Innovation Fund (IF) 47
3.3.2 The Technology and Human Resources for Industry Programme (THRIP) 49
3.3.3 Thuthuka 50
3.3.4 Institutional Research Development Programme (IRDP) 50
3.3.5 Indigenous Knowledge Systems (IKS) 52
3.3.6 Bursaries 53

3.4 International Science Liaison 54

3.5 The rating system 56

3.6 The South African Agency for Science and Technology Advancement (SAASTA) 60

3.7 Research infrastructure and the National Research Facilities 61
3.12.1 Adoption of a national key research and technology strategy 61
3.12.2 The National Research Facilities 62

4. INTERNAL ISSUES: HUMAN RESOURCES, TRANSFORMATION AND KNOWLEDGE MANAGEMENT 68
4.1 People management 68
4.2 Restructuring and transformation 71

4.3 Knowledge management and strategy 72
4.3.1 NRF online 73
4.3.2 Evaluation, monitoring, performance indicators 75
4.3.3 Information and strategy advice 76
4.3.4 Culture of learning and change 77

5. SUMMING UP: THE NRF’S STRENGTHS AND WEAKNESSES, AND OVERALL PERFORMANCE 79

6. CONCLUDING REMARKS 80

Appendix A: Terms of Reference 81
Appendix B: Review Programme 3 – 14 February, 2005 87
Documents consulted, and reference 104
Glossary of Acronyms and Abbreviations 106
EXECUTIVE SUMMARY

1. The National Research Foundation (NRF) commissioned this independent “Institutional Review”, at the request of the Department of Science and Technology (DST), after the end of the first five years of operation.

2. The purpose of the Review was to provide a retrospective view on the performance of the NRF and an assessment of the outcomes and impact of its activities. In addition, the extent and effectiveness of the integration into one new Foundation of the former Centre for Science Development (CSD) and the Foundation for Research Development (FRD) was to be assessed, the statutory mandate re-examined, and recommendations made regarding the strategic direction and operational execution of the NRF’s missions.

3. The Review Panel comprised Prof Wieland Gevers (convener), Prof Susan Cozzens (USA), Ms Mpho Letlape, Prof Cora Marrett (USA), Prof Deborah Posel and Dr Colin Webb (New Zealand). The Terms of Reference were approved by the DST and administered by a Reference Group (internal to the NRF) convened by the assignment principal, Dr. Khotso Mokhele, President of the NRF.

4. The Review Panel examined a large number of relevant documents, amongst them a number of subsidiary reviews by specialised panels of the well-established National Research Facilities, a self-review of the Research and Innovation Support and Advancement division (RISA) and a corporate self-review of the whole NRF completed in October, 2004. Particular attention was paid to recommendations made in past review reports that had a bearing on the NRF’s proposed development after its establishment in 1999.

5. The Panel heard from over 400 stakeholders over 10 days, in 3 cities, and presented a Preliminary Report of its findings and recommendations to a large group of NRF executives, managers and professional staff, as well as 3 representatives of the DST.

6. The principal recommendations of the Panel were ranked 1-13, in order of priority, but have been woven into the rest of the Report according to the logic of the narrative. Panelists took individual responsibility for the drafting and re-drafting of different sections of the preliminary and the Final Report, but all dealt with the whole Report in discussion and debate, and all support the final Report and the ranked recommendations.

7. South Africa is fortunate to have an active national research agency with the scope to shape a wider-ranging and ambitious research strategy in line with national goals. The Higher Education (HE) sector has undergone extensive, policy-driven change over the past 5 years, and there is acceptance of the need for research support (where the research culture and activity is well-established)
and research capacity development (where for historical and structural reasons this is not the case).

8. The NRF has increasingly to fulfil its missions in a continental and international context.

9. The NRF is well-positioned to support transformative national development though a balanced approach, synergistically promoting economic, social and environmental goals.

**Recommendation (1, in priority)**

The many achievements of the NRF in its first five years of operation should be recognised, and the critical role of the NRF as the premier national research agency affirmed, for the future of higher education, national development, and South Africa’s competitive positioning in the wider world.

10. The mandate of the NRF through its Act is “to support and promote research through funding, human resource development, and the provision of the necessary 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”.

11. The NRF’s activities have potential impacts in the broad South African society, though several dimensions. This desired “fanning out” of outcomes and impacts needs consistently to be built into the design of NRF programmes to maximise the likelihood that they will in fact take place.

12. The NRF currently translates its mandate into four core Missions:

- High-quality human resources in substantially increased numbers;
- The generation of high-quality knowledge in prioritized areas that address national and continental development needs;
- The utilization of knowledge, technology transfer and innovation to ensure tangible benefits to society from the knowledge created; and
- The provision of state-of-the-art research infrastructure that is essential to develop high-quality human resources and knowledge.
13. The NRF adds six cross-cutting corporate strategic priorities of redressing inequalities, adhering to quality, internationalising research, focusing on Africa, positioning the NRF within the National System of Innovation (NSI), and transforming the organisation itself.

14. The Panel views the optimal functioning of the NRF Board as of paramount importance in shaping strategy, testing proposals for new activities against the NRF Missions, and representing the Foundation up to the highest levels.

Recommendation (2, in priority)
Strengthen the NRF Board:

a. The Board should deal with NRF strategies, raise the profile of the national research Missions of the NRF, create accountability on the part of the organisation, and be active in forging external relationships.

b. The Board should lead in discussing and refining the Missions statement in consultation with all staff and stakeholder groups.

c. The Missions should always be used by the Board in evaluating current and proposed activities.

15. The relationship of the NRF to the DST is intrinsically crucial to its own functionality, especially in the context of the urgent need for fuller harmonisation of policies between the Department of Education (DoE) and the DST as they affect research at higher education institutions. A number of important practical issues affecting the system can only be solved if the coordination of policies is achieved and fully understood in the institutions where research is done and young researchers develop.

Recommendation (10, in priority)
Ensure complementarity of DST and NRF Missions, on the one hand, and those of the DoE and the CHE/HEQC, on the other:

a. The DST should focus on strategy for R&D across government, through coordination, policy and monitoring, as described in the national R&D strategy.

b. The NRF should lead in the development and implementation of research funding and capacity development outside government.

c. Research support policies in the NRF and DoE should be harmonized, and channels of communication and collaboration should be put in place. (The DST should facilitate this).

16. The NRF has multiple stakeholders usefully classified as research providers, research students, users of research and “complementors” (partners and co-funders). It is imperative that these groupings of stakeholders are viewed as each
having importance, often in inter-dependent ways. The style of relationship-building has to be one which “works with” stakeholders, consults earlier rather than later (or too late), and is strategic rather than problem-reactive in emphasis.

Recommendation (6, in priority)

Move to partnerships with key stakeholder groups (HEIs, government departments other than DST, science councils) that:

a. are proactively rather than reactively set in motion;
b. involve joint planning of joint ventures;
c. recognise contributions on all sides;
d. include consultation on key directions; and
e. define mutual responsibilities.

17 Management of funds for research is a core competence of the NRF, but requires close work with the relevant stakeholder community. Issues that arise are:

- agreement on the purpose of funding;
- good coordination of time-lines and a customized service;
- best practice in the setting up of evaluation panels;
- transparency;
- timeliness, responsiveness and accuracy;
- appropriate feedback;
- low transaction costs; and
- synergies among different funds.

Recommendation (11, in priority)

Create synergy among NRF programmes by:

a. recognising the diversity of funds and tailoring approaches and process to their purpose and needs; and
b. sharing good practice and learning across programmes.

18 The Focus Area Programmes represent an important facet of the NRF approach to the steering of the research system in the direction of its Missions. The merger within the NRF of the previous funding systems of the CSD and the FRD is reflected in the integration within the focus areas of themes that should permit both “traditions” to have access to resources and to develop a culture of interdisciplinary project design. The information supplied to us shows that funding (number and average value of grants) of the social sciences and especially of the humanities has decreased over time. There is also the perception, in all disciplinary sectors, that applied science is favoured over more fundamental
studies that are needed to maintain the vitality and cutting edge of South Africa’s research enterprise.

Recommendation (7, in priority)
Make the core research agenda genuinely inclusive, with:

- an appropriate balance across national goals to contribute to development and redress;
- an appropriate balance between basic and applied research;
- an appropriate balance of disciplines; and
- a genuine, open, and broad consultative process around funding-programme design.

19 The Panel believes that the NRF is severely affected in its work by the inadequacy of its resources, relative to the demand in the form of applications that meet evaluation criteria and deserve adequate support. In this environment of scarcity, the NRF’s attention to careful review processes has led to the irony of increasing efforts from applicants to receive very small grants. The problem is particularly true for activities supported by the parliamentary core grant, including support for researchers in the focus area programmes (where expenditure since 2001/2 has grown by only 9.9%), bursaries, and other research capability-development initiatives.

Recommendation (3, in priority)
Significantly increase funding to the parliamentary core grant to:

- support researchers and build high-quality research teams;
- ensure human capability development occurs within international quality research environments; and
- build critical mass in all research areas on which South Africa’s development depends.

20 The Innovation Fund (IF) is an NRF success story, but efforts are needed to obtain synergies between this programme, with its particular interventionist and project management orientation, and the rest of the NRF funding system.

21 The Technology and Human Resources for Industry Programme (THRIP) is also seen as a very successful programme. While there are co-funding issues and the main benefits so far have been in human capacity development (as opposed to technological innovation), the impact of THRIP is likely to be considerable over time because of its scope and widespread participation.
The Thuthuka programme is a growing and successful effort to meet the developmental needs of young, black and/or female academics. An identified problem is the requirement for majority co-funding; this could be addressed in institutional research plans drawn up to receive earmarked research subsidy.

The NRF was repeatedly praised for its role in developing research capacity and activity at research-disadvantaged institutions, be it the former technikons (now universities of technology or parts of comprehensive Institutions) or historically black universities. We have concluded that the NRF will be indispensable for the development of research at most institutions in the new landscape. It is in this arena, particularly, that close cooperation between the DST/NRF and the DoE/CHE will bear fruit.

Indigenous Knowledge Systems (IKS) have not yet been successfully nurtured by the NRF grant-making system despite the earmarked funding that is available. The panel believes that partnerships should be built with stakeholder communities, so that a rich vein of new and significant research can be tapped.

The bursary system is fundamental to fulfilling the capacity-building Mission of the NRF, yet under-funding (bursaries that are far too small measured against the needs of target student populations) and some administrative problems (timing of the announcement of grants, and payments) are decreasing the effectiveness of the intervention and jeopardising successful outcomes. Students are a legitimate stakeholder population of the NRF.

International agreements on science exchanges and collaboration have enormous potential through leverage of (inadequate) local funds and the powerful individual impact on students that results from international experience and exposure. The oversight function of the Science and Technology Agreements Committee (STAC) is important, and appropriate division of labour must occur between the DST and the NRF, as well as other role-players.

Recommendation (13, in priority)

Review the mechanisms for coordination of international science liaisons, and expand the activity

The “rating system” used by the NRF for the “track-record” evaluation of researchers has been extended to all disciplines, but is the subject of intense contestation and debate in the higher education sector, varying from advocacy by institutions developing a research profile (as an indicator of progress, for example) to active opposition and doubts on the part of serious scholars in the system.

We have found the rating system to be divisive in the scholarly community; have posed questions about its alignment with the NRF missions and the criteria used
in the NRF’s research funding system, and have heard from many groups that the rating system was increasingly irrelevant because its only link to funding was eligibility for longer-term support; believe there is unevenness in the instruments used for rating and problems with the “one size fits all” assumptions; and are concerned about the system’s inherent bias and excessive operational complexity.

As a review panel, we are sceptical about the merits of the NRF’s rating system, and are in unanimous agreement that a fully merit-driven competitive process of awarding NRF grants on the basis of proposals, weighing track record into the evaluation, would be an improvement on the current NRF policy of using ratings as a gateway to longer-term and continuing funding. We are convinced, however, that a decision on the rating system should not be imposed, but should be developed in a fully consultative process driven by the research community itself.

Recommendation (9, in priority)

a. A sector-driven task group should reconsider the rating system, in terms of its fundamental purpose and utility; and

b. The Higher Education sector should convene this task group, invite input from all stakeholders, and report to the NRF.

28 The South African Agency for Science and Technology Advancement (SAASTA) has become part of the NRF portfolio, and the Panel has been impressed by the imaginative thinking that has gone into the planned strategic expansion of SAASTA activities, well-aligned with the outreach function of the National Research Facilities.

29 The Review Panel is strongly supportive of the proposed National Key Research and Technology Infrastructure Strategy, long overdue, but warns that considerable demands will be made on the NRF as implementer of the strategy.

30 The National Research Facilities are described in NRF documentation as conforming to criteria developed from those suggested in the original “Report on National Facilities”. The Panel is not convinced that the criteria are necessarily appropriate as an instrument for determining the optimal size of the National Research Facility System. On the other hand, there are existing “National Research Facilities” that fall under government departments other than the DST, for example a number of natural science-focused museums (Department of Arts and Culture) or the South African Biodiversity Institute (Department of Environmental Affairs and Tourism).

The larger National Facilities draw heavily on NRF Executive time because of their complexity and international involvement. Despite this, we believe the Facilities have successfully contributed to meeting the NRF Missions, and are useful to SAASTA’s evolving strategies for encouraging young people to choose
science careers. They “make sense” in many ways but cannot become the tail that wags the NRF dog. The key questions are how they are to be managed, and how key budgeting issues can be addressed. To answer these questions, continuous interaction between the DST, the NRF Board and the NRF Executive is required.

We strongly support the filling of a new post of Vice-President with responsibility for national research infrastructure and the National Research Facilities.

**Recommendation (8, in priority)**

a. The challenges posed to the NRF’s mission and goals by the National Research Facilities should be the subject of a national discussion on investment in, and choice of National Facilities, including clear criteria; and

b. the NRF Board should consider the pro’s and con’s of NRF’s direct management of the National Research Facilities, including

- having an advisory board or council in place at some or all the Facilities;
- semi-independence through an appropriate governance model; or
- contracting out for the management of some or all the Facilities.

31 The Review Panel was disturbed by the fact that a well-positioned and generally trusted organisation such as the NRF could be showing considerable signs of internal stress, high turnover of staff and a number of shortcomings in the people management system.

Problem areas are consultation; communication; human resources policy implementation and process issues; difficulties with work/life balance due to attrition of staff and overload; inadequate induction and deficient succession planning; and problems with the expectations of job-holders relative to reality.

The first five years of the NRF’s existence have seen much growth and this, added to the initial turbulence coming from the merger of two separate funding organisations, has required restructuring and re-alignments of commitments and loyalties. The NRF seeks to become a “knowledge organisation” but there are still urgent issues of transformation, and the culture audit done in 2004 has highlighted many issues which need urgently to be discussed and acted upon.

**Recommendation (5 in priority)**

Act urgently on human capital issues:
a. Make concrete plans for retention of program staff.
b. Act on the RISA and SAASTA Culture and Climate Audit report.
c. Consult genuinely around internal decision-making.
d. Increase investment in training and open career paths.
e. Embed internal transformation.

32 The Knowledge Management and Strategy Directorate of the NRF holds the key to the ability of the organisation to streamline its activities, sharpen its evaluative capacity and underpin strategic decisions. The NRF Online misadventure has proved a serious setback for the Foundation, although efforts are being made to restore confidence in the system and to reap the benefits that a well-functioning on-line application and grant-handling system can deliver.

We are concerned overall that the cumulative effect of various pressures could undermine the confidence of the research community in the NRF as an efficient and capable grant-making and research support body. This needs urgent attention.

Recommendation (4, in priority)

Restore the core business processes to full functionality:
   a. Work with key stakeholders.
   b. Set timelines to fit stakeholder schedules.
   c. Train internally and externally for IT system changes.
   d. Do trials at stakeholder locations for new systems before full implementation.
   e. Pay special attention to implementation with disadvantaged groups and institutions.

33 The NRF is critically dependent on qualitative and quantitative information about inputs, activities and outputs, and these are tied to its capacity to develop strategies, to generate performance indicators and to measure performance against them. The NRF has developed a review culture which is beginning to approach best practice; it should, however, continue to strengthen measurement of outcomes and impacts, and consider how to improve the ratio of benefits to costs in this area.

Recommendation (12, in priority)

Strengthen and develop the Knowledge Management function:
   a. Develop a plan for KM&S to underpin other NRF functions.
b. Gauge the magnitude of NRF programmes against national goals.
c. Keep moving towards impact measurement.

34 We have summarised the NRF’s strengths and weaknesses as being a contrasting picture, on the one hand of a growing organisation, very well-positioned, with visionary leadership and “agency of choice” status in many quarters, on the other of an organisation that is showing signs of internal strain, a degree of “mission creep”, and a grant-making service that has begun to disappoint its users.

Some of the causes of the above weaknesses are external to the Foundation, such as under-funding of its core activity and inadequate policy harmonisation affecting higher education institutions. Another external problem is “reviewer fatigue” in a relatively small system that reflects a mismatch between effort (to review and/or to recommend a grant) and the resulting award.

35 We have presented 13 ranked main recommendations, arising from our review of the NRF activities. They all deserve serious consideration. We believe that of they are attended to the NRF will be able to perform extremely well over its next 5 years.

36 We thank all who have helped us through the review process. We are convinced that the NRF in worth affirming, and believe that its success in fulfilling its Missions and meeting its goals is a critical success factor for a prosperous South Africa.
Ranked Principal Recommendations

1. The many achievements of the NRF in its first five years of operation should be recognised, and the critical role of the NRF as the premier national research agency affirmed, for the future of higher education, national development, and South Africa’s competitive positioning in the wider world.

2. Strengthen the NRF Board:
   a. The Board should deal with NRF strategies, raise the profile of the national research Missions of the NRF, create accountability on the part of the organisation, and be active in forging external relationships.
   b. The Board should lead in discussing and refining the Missions statement in consultation with all staff and stakeholder groups.
   c. The Missions should always be used by the Board in evaluating current and proposed activities.

3. Significantly increase funding to the parliamentary core grant to:
   a. Support researchers and build high quality research teams;
   b. ensure human capability development occurs within international quality research environments; and
   c. build critical mass in all research areas on which South Africa’s development depends.

4. Restore the core business processes to full functionality:
   a. Work with key stakeholders.
   b. Set timelines to fit stakeholder schedules.
   c. Train internally and externally for IT system changes.
   d. Do trials at stakeholder locations for new systems before full implementation.
   e. Pay special attention to implementation with disadvantaged groups and institutions.
5. Act urgently on internal human capital issues:
   a. Make concrete plans for retention of programme staff.
   c. Consult genuinely around internal decision-making.
   d. Increase investment in training and open career paths.
   e. Embed internal transformation,

6. Move to partnerships with key stakeholder groups (HEIs, government departments other than DST, science councils) that:
   a. are proactively set in motion, rather than reactively;
   b. involve joint planning of joint ventures, by appropriately skilled staff;
   c. include consultation on key directions;
   d. are communicated to the wider system; and
   e. define mutual responsibilities.

7. Make the core research agenda genuinely inclusive, with:
   a. an appropriate balance across national goals to contribute to development and redress;
   b. an appropriate balance between basic and applied research;
   c. an appropriate balance of disciplines; and
   d. a genuine, open, and broad consultative process around funding programme design.

8. Resolve National Research Facilities challenges:
   a. NRF should facilitate a national discussion on investment in and choice of national facilities, including developing clear criteria.
   b. The Board should consider the pros and cons of NRF’s direct management of the facilities, including:
      • having an advisory board or council in place at some or all of the facilities;
      • semi-independence through an appropriate governance model; or
      • contracting out for the management of some or all the facilities.
9. Rating System
   a. A sector-driven task group should reconsider the rating system in terms of its fundamental purposes and utility.
   b. The higher education sector should convene this task group, invite input from all stakeholders, and report to the NRF.

10. Ensure complementarity of DST and NRF Missions, on the one hand, and those of the DoE, on the other:
   a. DST should focus on strategy for R&D across government, through coordination, policy and monitoring, as described in the R&D Strategy.
   b. The NRF should lead in the development and implementation of research funding and capacity development outside government.
   c. Research support policies in the NRF and the DoE should be harmonized, and channels of communication and collaboration should be put in place. (The DST should facilitate this.).

11. Create synergy among NRF programmes by:
   a. recognising the diversity of funds and tailoring approaches and process to their purpose and needs; and
   b. sharing good practice and learning across programmes

12. Strengthen and develop the Knowledge Management function:
   a. Develop a plan for KM&S to underpin other NRF functions.
   b. Gauge the magnitude of NRF programmes against national goals.
   c. Keep moving towards impact measurement.

13. Review the mechanisms for coordination of international science liaisons, and expand the activity.
1 INTRODUCTION

1.1 Purpose and Scope
The NRF commissioned this review at the request of the Department of Science and Technology, as one of the institution-level reviews of the organizations that report to the Department. The review comes after the Foundation's fifth year of operation, as a self-managed, independent evaluation.

The purpose of the review was to provide:

- a retrospective view on the performance of the NRF in terms of
  - the mandate stated in the NRF Act, as well as
  - the objectives in the strategic and business plans of the NRF;
- an assessment of the outcomes and impact of the activities of the NRF;
- an assessment of the extent and effectiveness of the integration of the former CSD and the FRD;
- an assessment of the scope of the NRF mandate as stated in the NRF Act, as a result of more recent acquisitions i.e. South African Agency for Science and Technology Advancement (SAASTA) and the National Zoological Gardens, and implications for the current and future strategic objectives and activities of the NRF;
- based on the above, recommendations regarding the strategic direction and operational execution of the NRF mandate.

The review covers the past five financial years, i.e. since the inception of the NRF on 1 April 1999 up to 31 March 2004, and includes more recent activities selectively, in response to issues raised in interviews.

1.2 Process of the review
The full terms of reference appear in Appendix A. The main review activities took place over February 3-14, 2005 (Appendix B). After being briefed by the reference group, the review panel undertook ten intensive working days of wide-ranging and varied interviews, in three cities, with the groups described below. In addition to the agenda of interviews set by the NRF, the review panel asked the NRF to establish a special email address to receive comments across the country’s research communities, whether or not the respondents were NRF-rated and/or grant-holders. The availability of the email address was advertised on the NRF website and through NRF contacts at higher education institutes, who were asked to advertise it widely on their campuses.
A stakeholder survey commissioned by the NRF Executive was presented to the Review Panel at an incomplete stage, and its preliminary findings and conclusions were not used in compiling this Report.

1.3 The evidence base for the review

The panel reviewed the large number of previous reviews and assessments listed in Appendix C, and met with a large number of people representing the NRF’s extensive stakeholder groups. The team heard from over 400 individuals, representing the following groups:

- NRF executive management and other staff from both RISA and the national facilities
- NRF Board
- Government departments (DST; DoE; DoL; the dti; DoA; DAC) and advisory councils (NACI; CHE)
- Science councils (Geosciences; CSIR; HSRC; MRC; SABS; WRC)
- Museums
- Industry
- International partners
- University and university of technology organizations, (SAUVCA, CTP), institutional research deans or directors, and students
- Relevant organizations such as the NSTF, ASSAf, SAAE and SARIMA
- Grant holders, reviewers, and members of assessment panels

The responses sent by email to the Review Panel were also considered. We were provided with a copy of the RISA and SAASTA Climate and Culture Audit Report of July, 2004, the contents of which inform our observations made in several sections of our report. A stakeholder survey commissioned by the NRF Executive was presented to the Review Panel at an incomplete stage, and its preliminary findings and conclusions were in general not used in compiling this report.

1.4 Outline of the report

This report first outlines the general environment of the NRF, then reviews its mission and governance structures. The second section of the report summarises issues in NRF operations, that is, its funding programmes, the National Research Facilities and SAASTA. A third section focuses on internal matters including human resource and knowledge management. The final section summarises the NRF’s strengths and weaknesses and the panel’s conclusions on the NRF’s performance.
2 THE GENERAL OPERATING ENVIRONMENT OF THE NRF, MISSIONS, GOVERNANCE AND STAKEHOLDER RELATIONSHIPS

2.1 Positioning the NRF

South Africa is one of relatively few developing countries which has an active national research agency with the scope to shape a wide-ranging and ambitious research strategy in line with national goals. It is critically important that the country makes the most of this valuable resource.

This requires, in the first instance, being mindful of the bigger landscape of the NRF’s operation.

The NRF has to position itself increasingly in continental and international, as well as national, arenas.

Nationally, the commitment to fairness and equity inscribed in the constitution prescribes efforts to redressing inequities in access to education, transforming the institutional landscape of higher education, and building research capacity in groups and regions which have been under-developed in the past. Recent changes in higher education policy have acknowledged the heterogeneity of tertiary institutions, and have emphasised the need to concentrate broad-ranging research efforts in a subset of those where research traditions are well-established. There is however, the important expectation that every institution will become research-active, within appropriately defined niche areas. There is also an increasingly strong emphasis on quality assurance within this sector.

The imperatives to build research capacity and promote research excellence are all the more compelling in the midst of serious shortages of high-level skill, which have to be addressed if South Africa is to position itself competitively in the global economy. This places a premium on the promotion of expertise in science and technology, at the cutting edge of international research and innovation. At present, it is the declared intention of government to move 1% of the GDP into natural science, engineering and technology (SET).

The country’s developmental agenda is wide-ranging, across social, cultural, political and economic spheres, however. Efforts to tackle poverty, inequality, disease and crime are all urgent and complex, and must be underpinned by intellectual innovation and research across the full spectrum of disciplines. SET alone is insufficient to improve the quality of life of all South Africa’s people.

While a developing country with fewer resources to allocate to research than more developed nations, South Africa enjoys a reputation for stellar and pioneering research in many areas. Many of its distinctive research challenges and opportunities are of intense global interest – such as its wealth of fossils, disease profile, and the complexities of its social and cultural transition. South Africa is therefore well-positioned to enhance and expand its scientific standing within the wider world, provided there is
sufficient space for rigorous, theoretically robust research, unfettered by instrumental interest in short-term problem-solving.

South Africa’s positioning within the African continent has changed profoundly since 1994, with important implications in the arenas of higher education and research. Not only has there been a dramatic increase in the numbers of students from other African countries entering the country’s universities as students and research staff; there are also new opportunities to refashion South Africa’s research agenda with wider African referents. NEPAD, as the major driver of continent-wide developmental initiatives and champion of Africa’s rightful place in global agendas, is a potentially powerful conduit for linkages in the research and higher education sectors.

Since 1994, the cessation of the academic boycott and international enthusiasm to work with South African researchers has profoundly transformed the environment of higher education and the research sector. Exciting new international linkages and partnerships have proliferated, and many more are still possible, associated with significant material investment in the country’s research and development from outside.

At this moment in South Africa’s history, therefore, the promotion of varied types of research, across all the disciplines, is of the utmost importance. This environment is complex and contested. There are tensions within and between the various imperatives driving a national research agenda, associated with competing interests and powers across the society.

The NRF has had, and will continue to play, a central and critical role in this ambitious endeavour. It will be impossible to meet this challenge without appropriate orders of funding. It is also crucial that the task be addressed with a clear sense of mission and strategic direction, while remaining responsive to the views of the full range of stakeholders.

2.2 National goals

The issues outlined above highlight the need for a strong focus on South Africa’s goals, and recognition of the role all research disciplines and the full spectrum from basic to applied research has in achieving them. This section provides a brief commentary on national goals to provide a framework for discussions later in this report around the balance of research funding.

The White Paper on Science and Technology (1996) outlines a vision that embodies a coordinated effort in achieving South Africa’s national goals. The paper also identifies a number of broad themes, most of which align with clusters of social development, economic development, or environmental sustainability outcomes. This is similar to the approach taken by many countries, and also individual companies, to a “triple bottom line” approach that balances these three areas when thinking about progress and development.

In addition, the White Paper and South Africa’s National Research and Development Strategy (2002) identify a set of other issues that need to be addressed to move South
Africa toward its goals. Three key ones in relation to the contribution of research, science and technology are:

- Developing human resources
- Knowledge generation
- Developing national physical infrastructure (clean water, electricity, communications, distribution and transport networks, the built environment, etc.)

The three clusters of outcomes and the three underpinning issues are portrayed in the following diagram. For South Africa these all sit within the context of transformation and the need to “undertake the task of the equitable development of the life opportunities for all of its citizens” (Reconstruction and Development White Paper 1994).

Social development and well-being outcomes include

- Social outcomes
- Health outcomes
- Cultural outcomes
- All of which include transformation to create equitable opportunities.

Economic development outcomes include

- Addressing poverty issues
- Increasing productivity (production and efficiency) for existing core industries such as agriculture and mining
- Creating new added value (beneficiation) from these industries
- Establishing new industries from opportunities related to these first two; and
- Establishing new knowledge intensive industries
Environmental outcomes include

- Biodiversity, conservation and restoration
- Ensuring economic development occurs within a sustainable development framework

**Recommendation (1, in priority)**

The many achievements of the NRF in its first five years of operation should be recognized, and the critical role of the NRF as a national research agency affirmed, for the future of higher education, for national development, and South Africa’s competitive positioning in the wider world.

**2.3 Mandate, Missions and impact**

The establishment of a National Research Foundation was recommended in the White Paper on Science and Technology, which assigned it the function of support to research and research capacity building. The Foundation was envisioned as a flexible organization that would change its structure in relation to the nation’s research needs. It was charged with creating an ongoing dialogue with its stakeholders in the tertiary education system on the issues of research support and capacity building.

Such a dialogue was initiated as the Act establishing NRF was drafted. As stated in that Act, the mandate of the National Research Foundation is

> “to support and promote research through funding, human resource development, and the provision of the necessary 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 specific roles that NRF plays in the National System of Innovation (NSI) are developing human resources (trained professionals who move into many parts of the economy) and in developing research capacity in higher education institutions. Its programs help university researchers participate in creating a base of knowledge to address national problems and pursue fundamental questions in their fields. Virtually every organization in the National System of Innovation is a potential NRF partner, and many different kinds of partnerships are appropriate, as outlined in various sections in this report. NRF’s partnership with the Department of Education is particularly important, since both share responsibility for building research capacity in the Higher Education Institutions, yet each brings unique resources and capabilities to the task.

Ultimately, NRF’s activities have impacts in broader South African society. The diagram below (from Cozzens, 1994), shows that these impacts are achieved through several dimensions of its activities. Its grant holders train professionals, contribute to a
knowledge base that is useful for solving specific problems, and help raise standards in the education system generally. The immediate outputs of the activities it funds are research results, graduates, and innovations. Its intermediate outcomes can be measured in the flow of trained people, the uptake of knowledge or innovations produced with its funding, and the increasing research capacity of higher education institutions. NRF’s longer term impacts are felt in society more broadly, in improved environmental conditions, increased employment opportunities, and a richer cultural life. However, since the NRF’s activities are only some among many that contribute to these goals, its specific impact may be better illustrated than measured.

The Foundation is assigned many specific functions in the NRF Act. Recent strategic documents have condensed the NRF’s Missions in the following form:

The four corporate core Missions of the NRF are to develop and support:

- high quality human resources in substantially increased numbers;
- the generation of high-quality knowledge in prioritized areas that address national and continental development needs;
- the utilization of knowledge, technology transfer and innovation to ensure tangible benefits to society from the knowledge created; and
- the provision of state-of-the-art research infrastructure that is essential to develop high-quality human resources and knowledge.
These missions are accompanied by six cross-cutting corporate strategic priorities:

- Redressing inequalities in race and gender;
- Adhering to quality;
- Internationalising research;
- Focusing on Africa;
- Positioning the NRF within the NSI; and
- Transforming the NRF organizationally.

The four Missions are lenses through which the various groups we met with viewed NRF. Different groups see different Missions most prominently, from their perspectives. The Departments of Trade and Industry and Labour, for example, tended to focus on the development of human capital. Researchers from the higher education system focused on research funding, along with their human resource development activities inside and outside the laboratory. Industry and research council stakeholders focused more strongly on knowledge transfer. The Department of Science and Technology, in addition to its support for the core capacity-building Mission of NRF, was particularly concerned with maintaining and growing national facilities in areas of South African strength such as astronomy.

The various activities that are currently in the NRF portfolio each reflect one or more of these four Mission areas, in different proportions. Human resource development is woven into virtually all the programmes, for example:

- The bursary programmes directly support postgraduate students in research-intensive programs. These include merit scholarships, redress and equity scholarships, the growing Thuthuka program for young, black, and female researchers, and the new scarce skills bursaries funded by the Department of Labour.

- Many more bursaries are embedded in research projects supported through the Focus Areas.

- The Human Resources for Industry Programme (THRIP) trains postgraduate students to enter careers in industry, by embedding them in innovation-oriented projects involving collaboration between universities and industry.

- The South African Agency for Science and Technology Advancement (SAASTA) reaches out to the general public and works with schools to attract young people into science, engineering, and technology (SET) careers.

NRF’s current emphasis on the Ph.D. as the driver of national growth and change is one of many possible manifestations of the centrality of human resource development in its self-image and the image of many of the most important groups in its environment.

The knowledge creation function features strongly in several programmes, for example:

- The Focus Areas provide the major national source of project funding across all fields of knowledge production.
• THRIP funds research in industry and innovation related areas.

• The Institutional Research Development Programs build capacity for research activities at historically research-disadvantaged institutions, in part through the identification and investment in Research Niche Areas on these campuses.

The knowledge transfer function is of course implicit in the programmes that build human capital, as trained graduates move into various areas of the economy. In addition, it is explicitly built into several NRF programmes:

• The Innovation Fund focuses on moving new ideas into innovation, particularly where the innovations can be commercialized. It is also building capacity in higher education institutions to address intellectual property issues.

• THRIP encourages knowledge transfer through cooperative relationships as well as training students for jobs in industry.

• The Focus Areas include consideration of knowledge transfer in the funding criteria for projects on topics of national importance.

• The new Universities of Technology have received special attention under the Institutional Research Development Programme, and they specialise in technology transfer.

At the time of writing, the national infrastructure Mission of the NRF has taken form primarily in its role in managing the national facilities. However, a national equipment strategy has now been articulated and funds allocated for the NRF to disburse in the coming fiscal year. Under this strategy, the Department of Education will administer catch-up funds to re-equip laboratories at universities, which will then have the responsibility of maintaining and reinvesting in them. The NRF’s special responsibility will lie in middle-range equipment, usually shared across campuses, as well as with the national facilities.

Based on these observations, we conclude that the NRF remains focused on its mandate as stated in the White Paper, the National R&D Strategy, and the NRF Act.

In addition to the four official Missions of the NRF, we encountered some informal notions about its role and function that are held across a number of the groups we talked to. One is that the NRF could be the “agency of choice” for managing a wide range of research related programs funded by various parts of government and the private sector. Another is that the NRF should be a change agent in the National System of Innovation, identifying issues, analyzing alternative courses of action, and leading the discussion. A third is that its processes benchmark and certify excellence in the research system. These ideas seem compatible with the Foundation’s formal missions, but do not require revisions in the mission statement or Act.

We encountered frequent questions about “Missions creep” at NRF, because of the range of activities it now houses under the “agency of choice” notion. The NRF Board has debated this issue when acting on the requests to incorporate the activities in question, with the most recent controversial example being the National Zoological
Gardens. The Board is the appropriate custodian, in our view, of a strong sense of the core NRF Missions and the application of that sense to decisions about incorporating or not incorporating proposed structures and activities.

We note, however, that the NRF Act forbids the Foundation from "conducting research other than research regarding the efficient and effective execution of its functions." This provision appears to be in contradiction with the provisions of the Act for NRF concerning national facilities. We suggest that the Board consider these contradictions carefully, possibly proposing bringing the various sections of the Act into alignment with each other.

We see the four Missions as intersecting and mutually reinforcing. But we found that the four do not necessarily sit comfortably with each other within the organization. Actual awareness and embrace of the cross-cutting natures of the missions is well below optimum. Employees describe the various parts of the organization as operating in silos. In the funding section below, we take up the issue of developing on the ground synergies among the programmes.

### 2.4 Governance

In this section, we include a discussion of the Board and its role and the relationship between NRF, its parent department, the Department of Science and Technology, and its potential partner, the Department of Education. We have not been able in this review to distinguish between the Minister of Science and Technology and the line department, if such a distinction has any operational significance.

#### 2.4.1 The NRF Board

The NRF Board includes twelve members, chosen broadly from across the higher education sector and industry. In our review process, we interviewed the two Board members who made themselves available early in our process and talked at some length with the Board chair. We also heard views on the operations of the Board from DST and NRF staff and from university personnel.

There was a general feeling across these reports that while all the members of the Board bring useful skills to their positions, many are too busy to invest much time in the NRF. The Board chair reported maintaining open communication channels with the NRF President and with the Minister of Science and Technology. Both on and off the Board, the Board’s intervention at higher levels with regard to funding for research in the iThemba Labs was considered a successful application of Board skills (although the Department indicated that the money shifted to iThemba had been moved from another part of the NRF’s budget). The Board considered a number of key strategic issues for the NRF over the years, including those raised by the merger of social science and natural science organizations in forming the NRF; the rating system; the expansion of the NRF’s activities through the incorporation of new programs and national research facilities; and the establishment of a separate building not containing inflammables to
house the fish collection at SAIAB. The Board is also playing a key role in filling the two vacancies in Vice-Presidential positions.

The System-wide Review in 1977 discussed the role that the Board ought to be playing (informed by national recommendations on the role of Boards produced by the King Commission). These include:

- improving linkages between entities and their sectors;
- promoting the public face and impact of the entity;
- as well as financial oversight and
- support for the executive in its relationship with DST and the Minister.

Our interviews indicated that the Board is much more active in the last two areas than the first two. There is also a perception that the current Board is tilted much more toward the natural sciences in its interests than towards the social sciences.

In particular, there seems to be plenty of room for the Board to play a stronger role in strategic thinking for the organization. We recommend, for example, that the Board take the lead in articulating, reaffirming, and communicating the NRF’s Missions. On the basis of this, the Board should set the criteria for inclusion or exclusion of various proposed activities, including additional national facilities. The Board should approve any major changes in NRF focus (for example, the recent adoption of the PhD as the organizational driver), and enforce NRF’s responsibility to consult broadly with higher education institutions before setting such strategic directions both before and after the development of high-level proposals placed before the Board.

**Recommendation (2, in priority)**

**Strengthen the NRF Board:**

a. The Board should deal with NRF strategies, raise the profile of the national research Missions of the NRF, create accountability on the part of the organisation, and be active in forging external relationships.

b. The Board should lead in discussing and refining the Missions statement in consultation with all staff and stakeholder groups.

c. The Missions should always be used by the Board in evaluating current and proposed activities.

**2.4.2 Relationship with the DST**

A number of comments from many different stakeholder groups were addressed to the perceived overlap and “competition” in function between the NRF and the DST. There is a widely shared view outside NRF that DST is increasingly performing agency functions that could and should be assigned to the NRF or other agencies. In some cases, potential NRF grant holders go directly to DST for funding because they can get more
money there than from the equivalent NRF program. DST’s focus on direct economic outcomes of the research system was seen by some to undermine the position of the social sciences at NRF and to exclude the broader view of innovation embodied in the Focus Areas, the NRF Act, and the recommendations of the Agency Function Review of 1997. Environmental scientists noted that the DST’s strategies were not inclusive of their research and looked to the Department of Environmental Affairs and Tourism for strategic direction.

In contrast, the DST and the Board Chair expressed satisfaction with the current division of labour between the two organizations.

The National R&D Strategy (2002) describes the role of the DST in the following way:

*The new strategy embodies a clear operational distinction between the integrative department responsible for the “global” management of science and technology across government and line departments with sector strategies that necessarily involve research and development. The integrative Department of Science and Technology will be responsible for a regulatory framework affecting all institutions with research and development as a priority mandate, whereas the line departments will set objectives and budgets for these institutions within this framework. In addition, the major cross-cutting funding agencies for research and development [NRF is included among these] will reside under the Department of Science and Technology, as will state-owned laboratories and research organizations with mandates cutting across the responsibilities of many line departments.*

The industrial stakeholder group we met recommended that the DST should focus, as the R&D Strategy describes, on policy, planning, coordination, and the monitoring of science and technology activities carried out by other departments and the organizations that report to it.

NRF could benefit from DST’s help in coordinating its efforts in areas of common interest with other government departments. The current relationships with the dti, a key link to the private firms that lie at the center of the national system of innovation, and with the Department of Labour, appear positive and constructive. Other important relationships should be in operation with such other departments as Arts and Culture, Environmental Affairs and Tourism, Health, Agriculture, and Foreign Affairs. All the department-to-department relationships seem to work reasonably well at staff level, but some joint actions need higher level facilitation, which DST can and should provide. We discuss this further in the next section, and in the following section on stakeholders.

### 2.4.3 Relationship with the DoE

The greatest importance needs to be attached to harmonisation of the policies and practices of the DoE (advised by the CHE) in relation to higher education institutions, on the one hand, and those of the DST and the NRF, on the other. In addition, the higher education institutions themselves, individually and collectively, are critically important to
the NRF in seeking to fulfil its Missions. The systemic Quality Assurance functions, including those for research, are vested in the CHE through its statutory subsidiary, the HEQC.

Amongst the policy frameworks that have a direct bearing on the NRF’s grant-making role are: the National Plan for Higher Education; including the new institutional forms, the Universities, Comprehensives and Universities of Technology; the Higher Education Qualifications Framework; Funding (subsidization) policy; including the recognition of research outputs of various kinds research capacity development linked to benchmarks set by the DoE; and Programme and Qualifications Mixes (PQM) that regulate the disciplinary domains in which higher degrees may be offered by individual institutions.

The Review Panel could find little evidence that the DST (by itself or through the NRF) and the DoE (by itself or on advice of the CHE) have addressed the obvious inter-dependencies between their policies and funding instruments, at least in documented form. The most urgent need is for clarity in the evolving model for research capacity development in institutions that fall short of the benchmarks for research productivity set by the DoE: will the NRF be a (preferred) partner/agency for the DoE and/or institutions in achieving the goals of enhanced research activity and capacity, bearing in mind that there is little expertise or experience in the Department in this field? Will the CHE through the HEQC be the preferred partner, with the NRF simply providing support from its diversified funds? Should there not be a clear-cut division of labour – the HEQC as the quality assurer of institutional mechanisms for stimulating and managing research activity, including the supervision of postgraduate students and post-doctoral fellows, and the NRF as a complementary role-player in evaluating, funding and supporting researchers, at both early and later stages of their careers?

We have been surprised at the lack of clearly articulated, publicly disseminated agreements between the two government departments and their two most significant advisory bodies or agencies that deal with research. The NRF will only be able to fulfil its Missions if this is rectified.

It was interesting to observe that SARIMA, a voluntary body with cross-cutting representation from most of the above organizations, is contributing materially to the building of research management capacity within institutions, and to the setting up of appropriate knowledge management systems. This seems to suggest that government officials are more comfortable in such settings, promoting coordination and cooperation across the lines, than in reaching formal agreements that can be implemented in the whole sector after widespread consultation.

**Recommendation (10, in priority)**

Ensure complementarity of DST and NRF Missions, on the one hand, and the DoE and the CHE/HEQC, on the other:
a. The DST should focus on strategy, policy, monitoring and coordination, as described in the R&D Strategy.
b. The NRF should implement and manage research funding and capacity development.
c. Clearly articulated policy harmonization for higher education institutions between the DST/NRF and the DoE/CHE should be sought and put in place.

\[2.5\text{ The NRF’s stakeholders}\]

\[2.5.1\text{ Who are the NRF’s stakeholders?}\]

This section considers issues relating to the identification of the NRF’s key stakeholders. The review panel’s concerns in this area are based on a consideration of the groups the NRF will need to consider as it moves to a clearer outcomes focus in its approach to measuring performance in relation to benefit to South Africa, comments from a few of the groups interviewed during the review, and other perspectives gained during the review. The main conclusion here is that the NRF needs to think more broadly about who its stakeholders are, and then about the sorts of relationships that it needs to have with them in order to fulfil its purpose. This second issue is dealt with in the next section.

The White Paper on Science and Technology (1996) defines South Africa’s system of innovation as consisting “of all individuals and organisations involved in creating and using a knowledge base in order to build a better South Africa”. This paper notes that the Green Paper enumerated a wide range of stakeholders in business, education, government, and civil society.

Given the NRF’s mission, particularly those parts relating to human capital development and the transfer of research results, the NRF’s increasing role in managing a range of funds on behalf of others, and the need to coordinate funding with other government agencies, and facilitate interactions among various participants in the NSE, the review panel considers that the NRF should take a broader view of its stakeholders than appears to be the case at present.

The move to a broader definition of stakeholders also aligns with a need to move, in terms of performance measures, to considering the outcomes and impacts the NRF’s funding has in terms of achieving benefits to the economy and in relation to other national goals, i.e., impacts that ultimately occur outside the science and technology system in communities and business. This issue is discussed in more detail in the Mandate, Mission and Impact section above.

The review panel suggests that the main groups of stakeholders of the NRF are as follows:
• Research providers (HEIs, other research organisations, including their researchers);
• Research students (included because of the mission related to human capital development, and as stakeholders directly in relation to student assistance);
• Users of research (including business, NGOs, communities, etc.);
• Complementors – those who are existing or potential co-funders of research or human capital development (DoE; DAC; DoL; DST, the dti; DoA; DoH; Science Councils; international agencies; etc.).

This approach knowingly leaves out the NRF’s relationships with its Minister, the policy functions of DST and other policy departments. These relationships, while vitally important in providing direction to and support for the NRF, are different in nature and have been dealt with elsewhere in this report.

Currently the NRF has the strongest focus on its research providers. This is reflected, for example, in:

• The program for this review, a breakdown of which shows that 24.5% of the time for interviews was with HEI administrators or researchers, with only one session (3.1% of the review interview time) with business and other end-users, and only two sessions with students (3.1% of the review interview time);
• A breakdown of the contacts supplied to the company doing the recent stakeholder survey that shows (leaving out NRF staff, reviewers and panel members) only a 0.75% representation of end-users.

This comment is not meant to detract in any way from the importance of the NRF’s relationships with HEI administrators and researchers, which in itself is under-developed.

2.5.2 Relationships with Stakeholders

This section builds on the last section and considers the sorts of relationships the NRF needs to establish with its key stakeholder groups. The analysis here is based in particular on the consistent view of HEI administrators and researchers, the views of the small number of complementors included within the program of interviews, and consideration of how best to manage the issues raised by students and end-users during the review panel’s limited interactions with them. The conclusion is that the NRF needs to commit to working in a very different way than it does at present with its key stakeholders, and to move to this new approach urgently.
The above diagram indicates the relationships among the NRF’s key stakeholder groups and of them with the NRF. This recognises that these groups also interact with each other, and this affects the role the NRF needs to play in each relationship.

The suggested approach is one of:

- A strong partnership with HEIs and other research providers, involving agreeing common purposes, understanding the roles of the partners, and working together proactively on all key issue of mutual interest;

- Through the partnership with HEIs, a facilitation/co-ordination approach to students, recognising that the primary relationship for students is with the HEI, but that there is a more direct relationship in relation to bursaries. This latter relationship will ideally have elements of partnership, and of service provision on the part of the NRF;

- Generally a facilitation role in relationship to research users as the primary relationship should be with research providers (this is likely to be a more proactive role for the NRF in relation to funds such as the IF and THRIP);

- Partnership and co-ordination role with complementors around co-funding.

Some stakeholders may belong to more than one of the four stakeholder groupings identified here, and some government departments will both be co-funders and have a policy role that influences NRF activity (e.g. in the case of DST, which has primarily a S&T policy role but also administers some funds). In such cases, it will be important that the NRF is clear about what role a stakeholder is playing in relation to a particular interaction.

Another key challenge the NRF needs to keep in mind is that it allocates funding largely to HEIs, which may encourage the latter to focus more on the NRF and its needs than on the students and users of research through whom benefits are delivered. A common understanding of this dynamic between the NRF and HEIs will be required.
A further issue is that the NRF will need to tailor its relationships with stakeholder groups differently for particular funds and funding areas. For example:

- In more basic research areas, the focus will be on HEIs and students (related to excellence and human capital development);
- In more applied areas (e.g. IF) there will need to be a stronger focus on research users in addition to research providers (relevance and excellence).

This balance among stakeholders needs to be considered throughout the NRF’s activities, in everything from the composition of the NRF board, its panels and advisory groups, to the way it consults on its strategic directions and communicates its intentions and develops its process and systems.

In addition, it is essential that the NRF move its discussions with stakeholders to one that is more proactive (working in a genuinely joint manner with stakeholders to plan the way forward toward common goals) rather than reactive (based around problems to be solved after they have occurred and where stakeholders are largely in a “complaint” mode).

The above commentary is based on consistent, frequent and widespread feedback from stakeholder groups the review panel has interviewed. This is true of HEIs generally (including their researchers), students, representatives of Science Councils, and the limited end-users the panel were able to interview.

Key messages around the style of the existing relationships are:

- The approach is more one of the NRF “doing to” stakeholder groups, rather than “working with”;
- That consultation when it occurs is too late;
- When the NRF frames an interaction as consultation, the reality is that it is more about informing stakeholders of decisions the NRF has already taken;
- That consultation is too problem-focused rather than strategic; and
- That the extent of consultation is insufficient to achieve sector understanding, buy-in, and to build relationships.

At a detailed level, there are a set of issue around responsiveness, etc, that are dealt with in the section on funding within this report.

On the positive side, many stakeholders gave very complimentary feedback about some programmes, and the helpfulness of NRF staff generally.

Stakeholders consistently indicated to the review panel a willingness to move to a very different way of working with the NRF based around both their recognition of the role research and human capital development plays in achieving national goals for the peoples of South Africa, and the critical roles of the NRF.

A further suggestion is that the NRF regularly arranges to work through strategic issues jointly with sub-sectors (e.g. with key university sub-sector stakeholders).
Recommendation (6, in priority)

Move to partnerships with key stakeholder groups (HEIs, government departments other than DST, science councils) that:

a. are proactively rather than reactively set in motion;

b. involve joint planning of joint ventures;

c. recognise contributions;

d. include consultation on key directions; and

e. define mutual responsibilities.
3. NRF FUNDING PROGRAMMES AND THE NATIONAL RESEARCH FACILITIES

3.1 General issues across all funds

This section covers a set of issues raised by stakeholders in relation to many of the funds managed by the NRF.

The feedback the review panel has received during interviews with stakeholders, and the assessment of the NRF’s approach by the review panel itself in relation to international experience in research funds management, indicates that the NRF in general has well-established, robust and well-managed funding processes across the range of funds for which it has responsibility. This is reflected in the view of the NRF as the agency of choice for funds administration held by many stakeholders, especially other government departments.

Research funding allocation processes are complex in that they need to balance a variety of perspectives and inputs (e.g. peer review with strategic relevance; research quality considerations with capability building). They also invariably involve a degree of subjective judgment on the part of panels and staff, and the often severe constraint of limited funding.

This means that funding systems, no matter how well managed, are the subject of complaints by researchers, and of controversy more generally among the stakeholder community.

During this review, the panel has heard a wide range of views about the NRF’s approach to funds allocation, with often-constructive suggestions for improving overall approaches and processes. Some of the issues raised are those typical of comments about any funding system which makes decisions on funding levels for research projects, and others result from misunderstandings or perceptions of funding intent or processes, but some are issues the NRF could address by modification to or redesigning its approach to achieve a greater degree of customisation than in currently the case.

In considering the redesign of approaches, the review panel’s view is thus that the NRF must work closely with the relevant stakeholder groups wherever possible. In addition, the NRF needs to enter a more engaged dialogue with its stakeholders to address issues of perception and understanding that underpin the more operational issues.

The following sections summarise the key issues that need to be addressed.

3.1.1 Purpose of funds and implementation

There are two issues here:
• Achieving a common understanding with stakeholders about the purpose of each of the funds the NRF administers; and

• Ensuring that the way in which each fund is implemented (criteria and process for allocation) aligns with the purpose of the fund and, again, that stakeholders understand this.

In relation to the first of these, examples of concerns raised by interviewees are:

1. Whether the primary focus for the Focus Area Programmes is on excellent research, on human capital development, or on relevance (application) to national goals. (This issue is considered in more detail in the section on this funding.)

2. Whether the focus of the IF is just on economic outcomes or is broader to include social and environmental outcomes, and where in the spectrum from research to (possible) commercialisation it is primarily focussed.

In relation to the second of these, examples of concerns raised by interviewees are:

1. The standards applied in the assessment of capability building proposals are inappropriately focused given that the purpose is to build capability rather than to recognise existing excellence.

2. The approach taken to funding of bursaries, and in particular the levels of funding, act to disadvantage those from historically disadvantaged backgrounds who do not have the additional resources to supplement the bursary, i.e., the approach undermines one of the key purposes of the funding.

In summary, the NRF needs to ensure that the purpose of each funding stream is clearly defined and this is then discussed with relevant key stakeholders to ensure a common understanding.

3.1.2 Coordination of time-lines and customization of service

The issue here is that both the communication of funding decisions by the NRF and the payment of funding needs to align with the financial and academic timelines of institutions (including their research students).

Examples of concerns raised by interviewees are:

• Notifications of bursary decisions after the students have already begun the academic year or have decided not to enrol.

• Lack of alignment with other funding sources such as the National Research Facilities.

• Retrospective payments when the institution, programme or individual does not have the resources to bridge the research programme in the interim.

The NRF needs to work jointly with HEIs to ensure timelines for conveying decisions and payment of funding align with institutional timelines.
3.1.3 Composition of panels

The NRF already takes an approach to panel membership that is close to best practice in that it aims to balance quality judgments (often through international peer review), with moderation of this by the panel, inclusion of relevance views where appropriate within the panel, and with appropriate input from staff in reaching the compromises required in making final recommendations in line with the purpose of the funds concerned.

However, in its interviews with HEI stakeholders in particular, the review panel heard frequently voiced concerns relating to panel composition and process. It should be noted that these views were at sometimes countered by those who had served on project review panels and so saw the process as fair.

As with other issues raised in this section, the review panel recognises that some of the concerns raised here are based on a less than full understanding by stakeholders of the NRF’s approach to panels or may relate to assumptions made on the basis of poorly crafted feedback to applicants.

Examples of concerns raised by interviewees are:

1. Panel composition does not reflect the discipline mix required to make balanced judgements (this view was expressed most often in relation to the social sciences and the humanities, but also in relation to other areas such as engineering, and applied research and technology transfer).
2. Panels do not include the particular sub-disciplinary expertise to make fair judgments.
3. Some panel members do not have sufficient experience or seniority to make sound judgements.
4. Panels do not take external reviewers into account.
5. The NRF staff or executive exercise too great a role in decision making when they lack the experience or particular expertise required.
6. Reviewers were becoming fatigued and as a result panels are increasingly poorly informed by the input required by a good system.

Key conclusions here are that the NRF needs to work jointly with stakeholders to address issues of concern and agree principles for panel composition, change panel composition in line with this, and feed back changes to the sector.

The review panel’s view is that the NRF should move to ensuring all higher-level moderation in relation to panel decisions are made by a stakeholder-based moderation panel rather than the NRF executive.

3.1.4 Transparency

Some of the concerns raised by stakeholders about the NRF’s funds allocation process are result of a lack of transparency for some parts of the process.
The major concern raised by stakeholders was panel membership. Being transparent about the composition of panels and any other advisory or decision groups is international best practice in countries with both large and small research sectors (this is done in the UK, US, and New Zealand for example). Moving to such an approach is also likely to assist the NRF in managing some of the perceptions about panel composition or at least make the debate an informed one.

Increased transparency in relation to other processes related to the process for allocating funds is also likely to assist the NRF in managing its relationships with stakeholders.

The review panel’s view is that the NRF should make the membership of all panels and advisory groups public through its website before each allocation round.

### 3.1.5 Timeliness, responsiveness and accuracy

Issues covered here relate to the interactions fund applicants have with the NRF when applying for funding, receiving funding results, reporting on funding, and any more general interactions with the NRF on about funds.

Much of what the review panel was told here may have its basis in problems with the implementation of the online system, and with internal restructuring and lack of adequate training for new staff.

However, the level of concern within the sector related to this set of issues is such that, if not dealt with urgently, it risks undermining the credibility of the NRF and hence its relationship with HEIs and individual researchers.

On the other hand, the recently completed stakeholder survey identifies the helpfulness and friendliness of NRF staff as one of the most positive things about the organization.

Examples of concerns raised by interviewees are:

1. Provision of inaccurate funding allocation information followed by corrections.
2. Lack of any notification following applications, including the non-notification of nil funding decisions and the expectation that the stakeholders are all in a position to regularly monitor the NRF website.
3. Long timeframes to notification of decisions.
4. Staff unable to provide information at all, or unable to provide accurate information in relation to funds
5. Lack of response to telephonic enquiries or no response at all.

To address these concerns, the NRF needs to work with key stakeholders to identify issues, and then move urgently to address concerns by ensuring:

- Systems are robust;
- Systems meet the needs of stakeholders including students;
- Responses are timely;
NRF staff receive adequate training so they are in a position to respond to stakeholder enquiries.

3.1.6 Feedback

Concerns raised with the review panel here relate to two things: the information provided by the NRF on the contents of peer review reports, and the final feedback provided by the NRF following proposal decision making.

In both cases, the concerns expressed by researchers are that the summaries are often factually incorrect, or sometimes reveal a lack of understanding of a research field, are inconsistent with other information provided by the NRF in relation to the same researchers, or the same or similar projects, and are sometimes worded in such as way as to cause offence (detailed examples are provided in the IKS evaluation, 2004).

The NRF is already aware of this issue, and feedback is identified as a key area to address by the stakeholder survey. The comments received by the review panel reinforce the importance of the NRF improving this area of its performance.

Suggestions for the NRF to consider in this part of its business are:

- Providing the original peer review reports to applicants instead of a summary prepared by staff.
- Ensuring new staff are trained and mentored in relation to providing feedback to applicants.
- Ensuring, as part of its increasingly partnership approach with HEIs, that there is a common understanding that funding constraints, especially in the Focus Area Programmes, mean that many research teams doing valuable high quality research will not be funded at all or will be funded at less than desirable levels (and giving the same messages where relevant in feedback).
- Ensuring feedback identifies clearly and accurately the reasons for non-funding e.g. lack of fit with program objectives or criteria, quality or relevance benchmarks not being achieved, or simply that insufficient funding is available in an area.

3.1.7 Transaction costs

The NRF itself recognises the importance of reducing transaction costs in its activities wherever possible without compromising robust assessment processes, but notes that this area remains challenging. NRF staff recognise that funds saved in administration will then be available to support research. Positive moves made to date include:

- Moving from the approach until 2002 of having annual awards for one year only, to 2- and 5-year grants (and in the area of Centres of Excellence to 10 years).
- Allocating responsibility to HEIs for some smaller funds (honours bursaries, some travel and course grants), although institution stakeholders raised issues with the
The review panel was told that the transaction costs for management of the RISA funds is currently 12%, and that for the Focus Area Programmes is around 6% of funds allocated. This is somewhat higher than equivalent programmes overseas (the equivalent figure for the NSF in the late 1990s was 5%; and at the same time for New Zealand’s main research fund, the Public Good Science Fund, 1.7%).

The issue of the transaction costs of dealing with NRF processes was raised regularly by the stakeholders interviewed by the panel. In particular, the area of concern related to the Focus Area programmes, where the costs of submitting proposals are widely seen as inappropriate in relation to the size of grants finally awarded. Researchers said the transaction costs were similar for gaining support from other NRF funds, but for the IF in particular, the size of grant finally awarded meant the cost were more bearable.

The key issue for the NRF to take action on is ensuring that the level of complexity of the allocation approach taken to funds allocation in the Focus Areas is appropriate to the size and focus of grants finally awarded.

In this regard, one interviewee commented that the final grants were so small that they essentially only supported students (with student support being a positive thing). And, that the NRF should recognise this and simplify its processes accordingly.

3.1.8 Synergies among funds

Over 5-year period covered by this review the NRF has been asked to manage an increasingly diverse set of funds created by the DST and by other government departments. This provides the opportunity for coordination and synergy among funds and sharing best practice.

From its interviews with stakeholders the review panel gained the impression that the funds have to date largely operated as silos, with the real integration often happening within the research teams as they attempt to piece together a range of funding to support themselves.

The RISA group within the NRF already identifies this challenge of creating “a seamless approach to research support and human capital development” in its self assessment report. This self-assessment emphasises the value-chain element of such synergies — the review panel also sees opportunities for funds to share good practice as different funds often have a major focus (e.g. around human capital development or use of knowledge in society) that may be a more minor but important aspect for another fund.

The more challenging issue, as alluded to elsewhere in this report, will be for the NRF to achieve synergies with funds administered by other agencies and departments, especially those managed by the DoE which go to the same set of HEI stakeholders as does much of the NRF funding.

Recommendation (11, in priority)
Create synergy among NRF programmes by:

a. recognising the diversity of funds and tailoring approaches and process to their purpose and needs; and

b. sharing good practice and learning across programmes.

3.2 Management of the Focus Area programmes

3.2.1 Disciplinary mix

Interviewees across the spectrum stressed the importance of the NRF, as a national research agency, funding and stimulating research across the full spectrum of disciplines. This included the conviction within many government departments that the country’s developmental agenda necessitated research in the social sciences and humanities and not merely in the natural sciences and economically oriented areas of inquiry. The NRF too, has continually affirmed its commitment to ensuring an appropriate disciplinary mix.

If there is consensus on the importance of the mix, there is also a widespread perception that it is currently not being realised adequately.

Points raised include the following:

- At its inception, the NRF was clearly sensitive to the need to merge the CSD and FRD as equal partners, and to ensure that the humanities and social sciences were appropriately showcased and promoted in the new organisation. However, many of those we interviewed, from within the higher education sector, as well as in government departments, research councils and within the NRF itself, felt that the interests, methods and views of natural science and natural scientists dominate the NRF. This they see reflected in the composition of the NRF Executive, the composition of grant-making panels, and in the view of some, the composition of the NRF Board.

- Funding opportunities are better in the natural sciences, particularly in areas aligned with economic development, where many researchers can draw on a wider range of funding, such as THRIP and the Innovation Fund, which have not generally been utilised by the humanities and social sciences. We also note, in this regard, the NRF’s concern at the decline in the number of grant-holders in the humanities and social sciences during 2003/04 (NRF Annual Report 2003/04, p. 25), as well as the overall decline in the amount of money disbursed to the social sciences and humanities. According to data given to the Review Committee by the NRF, in 2003/04, the number of grants awarded through the focus area programme to a researcher in the natural sciences and engineering (NSE) was 766, as compared to 157 in the social sciences and humanities (SSH). The value of these grants in the case of the NSE was R77 188 000 in 2003/04 (as compared with R76 268 000 in 2002/03) and just R9 274 000 in the case of SSH (as compared with R14 128 000 in 2002/03). The respective trends are also worrying. In the case of the NSE, the total value of grants during 2003/4
increased from R76 268 000 in 2002/3, a modest increase of 1.2%. In the case of the SSH, the total value of the grants during 2003/4 dropped from R14 128 000 in 2002/3, a decrease of 34%.

- There are also issues concerning the humanities in particular. In general, the social sciences are better served in the NRF’s research agenda than are the humanities. Many scholars, particularly those in the creative and performing arts, and theoretical disciplines such as philosophy, feel themselves excluded from the scope of the focus areas. Despite the attempt by the NRF to include a specific theme on ‘culture’ in the focus area on Distinct South African opportunities, and the relative openness of the focus area on Unlocking the Future, the perception remains that the focus areas and themes are too narrowly construed, particularly in requiring a grant applicant to demonstrate the relevance of the proposed research to the country’s immediate needs.

- The humanities are disadvantaged by the applied orientation of the focus area concept, and the ways in which this is portrayed in the NRF’s documentation. This might to some extent be a problem of perception, since grant-making panels were keen to encourage applications within the humanities, and some awards were made. But this does not dislodge the perception among scholars in these disciplines that their work does not resonate with the NRF’s specifications.

- There was also a particular concern among those in fundamental or theoretical disciplines, such as mathematics, physics, philosophy, that they were not accommodated within the NRF’s suite of research funding.

### 3.2.2 The mix of basic and applied sciences

There is firm support within government departments, research councils, business and industry, as well as within academic communities, for ensuring adequate funding for, and stimulation of, basic research. The point was made repeatedly that unfettered scientific inquiry, which is theoretically robust and imaginative, with an eye to the ‘big’ questions, is a critical developmental resource for the country. In the long term, excellence and variety in basic research is as vital to the development of research quality and capacity as more instrumentally driven research which focuses on short-term problem-solving.

In some areas, there is also a very fruitful cross-over between basic and applied research, to the point that the distinction itself has become porous and fluid.

Despite this consensus, however, many perceive the balance to have shifted in favour of applied work. This perception is particularly prominent within academic research communities, and based largely on a reading of the Focus Areas as attempting to steer the research funded in applied directions.

Conversely, both engineering researchers and those from Technikons indicated that they saw the Focus Areas as not accommodating their more applied and technology transfer oriented activities.
3.2.3 The mix of research in relation to national goals

The focus areas provide a framework that balances research related to social, economic and environmental goals. This aligns with the recommendation of the review committee which focused on the merger of the CSD and FRD which stressed the importance of positioning the NRF in relation to all the country’s developmental goals, so that research in social and cultural areas was not under-developed by an over-emphasis on economic issues. It also stressed the national interest in a culture of robust public debate on the key questions of the day.

Three issues raised during interviews and discussions by the review panel are worthy of note here. Firstly, as noted above, many researchers in the humanities in particular do not see a place for themselves within the FA programmes. Second, it is the review panel’s view that research in any discipline may contribute to social, economic or environmental goals (the social sciences in particular are critical to economic development goals, not just to social outcomes); however, the impression we gained is that this integration remains difficult to achieve. Third, some environmental scientists interviewed by the panel noted that their research aligned well with the NRF’s strategic directions, but were not well articulated by DST. For example, the National R&D Strategy (2002) scarcely mentions environmental issues and would have been usefully supplemented through consultation with DEAT.

These issues are only likely to be addressed by the NRF working with key stakeholders to address the issues of balance across the NRF’s funds, particularly in relation to the social sciences and humanities, and that between basic and applied research. In order to be successful this initiative should be truly joint with researchers and research managers from the outset, so as to ensure the necessary sector buy-in and make the best use of sector knowledge.

Recommendation (7, in priority)
Make the core research agenda genuinely inclusive, with:
   a. an appropriate balance across national goals to contribute to development;
   b. an appropriate balance between basic and applied research;
   c. an appropriate balance of disciplines; and
   d. a genuine, open, and broad consultative process around funding programme design.

3.2.4 Costing issues

The approach taken to funding allocation in the Focus Area Programmes is one of marginal costing in that it does not include salaries, overheads, or depreciation related to equipment. This raises a number of issues.
Firstly, it requires some policy coordination and complementarity among funders of the same research teams to ensure research teams are not left without any source of funding for some activities (such as equipment purchasing) and that policies that differ amongst funders do not provide contradictory incentives.

Secondly, it requires recognition of the fact that some research areas are able to access additional sources of funding (e.g. industry) much more easily than others and so are less affected by a marginal funding policy. For some research areas (e.g. the humanities), this means there are few sources of additional funding to supplement student bursaries for example.

Thirdly, it requires an understanding by the NRF, that although they are funding a project, they may be a minority funder, a status that has implications in relation to issues such as reporting, intellectual property, etc.

### 3.2.5 Reporting

The NRF requires reports on all major grants, but the information is not currently available or is, but in summary form only. NRF staff indicated to the review panel that they are working toward an approach that will make much more information publicly available both in relation to what is being supported, and during and on completion of projects, about what has been achieved. The review panel strongly endorses these developments.

### 3.2.6 The level of funding for the parliamentary core grant to RISA

The core grant funds allocated through the Focus Areas and other programmes, are the major source of generic project funding within South Africa’s research system. These funds need to support all research disciplines, particularly at the basic and more longer-term strategic end of the research spectrum, and to support these across the full spectrum of national goals related to South Africa’s development.

In addition, under the current approach to this funding, the NRF tries to balance the allocation of this funding among:

- Supporting high quality research projects and researchers;
- Developing the research human capital base that is so critical to South Africa’s future; and
- Focusing research into a number of areas identified as critical for South Africa’s development.

Over the period under review, the parliamentary core grant increased by 40%, from R183 million to R256 million. Expenditure in the Focus Area Programmes (initiated in 2001/2) has grown by only 9.9% from R78 657 000 to R86 461 000 (data supplied by the NRF).
THRIP, IF, and the Scarce Skills Fund (funded by other departments and not included in the parliamentary core grant) have grown faster than the rest of the Agency, and additional separate funds are currently being discussed.

While these externally funded instruments are valuable in their own way, such an approach to increasing funding has several risks, the most relevant of which in relation to this section are:

- Most of this additional funding has a narrower focus than the core parliamentary funds, for example just on economic outcomes or at the applied end of the research spectrum. The risk here, in the medium term, is that the underpinning research (in the core area) is not of sufficient critical mass to go on sustaining the other funds which depend on it in order to remain innovate and grounded (i.e. to ensure more applied research is well-grounded and arrives at sustainable solutions).

- To ensure high quality human capital it is essential that this capital be developed within high quality research environments fostered by researchers of international quality. Currently, this is threatened by the paucity of funding available to the researchers themselves.

If the core grant funds allocated through the Focus Areas are to achieve all of their aims (support for high quality researchers, human capital development, and a critical mass of research across all areas of importance to South Africa’s development), then a significant increase in funding to this area is both critical and urgent.

The review panel strongly endorses the need to increase funding in line with the approach outlined as longer term targets in the RISA section of the NRF Business Plan 2005/06–2007/08.

Recommen(dation (3, in priority)

Significantly increase funding to the parliamentary core grant to:

a. support researchers and build high-quality research teams;

b. ensure human capability development occurs within international quality research environments; and

c. build critical mass in all research areas on which South Africa’s development depends.

3.3 Other funds and programmes

3.3.1 The Innovation Fund (IF)

The Innovation Fund is undoubtedly one of the NRF success areas and the people that the panel interacted with that have been beneficiaries of it are very complimentary and appreciative of the impact it has had on their initiatives. The IF was founded by the
Department of Science and Technology in 1996 and is now managed by the NRF. The objectives of the Innovation Fund are to:

- promote technological innovation;
- promote increased networking and cross-sectoral collaboration; and
- to promote the key issues of; competitiveness, quality of life, environmental sustainability and the harnessing information technology.

Previous reviews of the fund made the following observations:

1. Evaluation of the Innovation Fund Programme, 1998-2001, Rounds 1-3 in 2002. The major recommendations made from that report were:
   - that the role and objectives of the IF should be clearly defined within a broader economic and social development framework and that this should be communicated broadly.
   - that “proper management and corporate governance systems need to be put in place to prevent misuse of the funds and to allow for transparency of the process”, and that these be managed by an organisation experienced in managing funds.

2. Innovation Fund Themes Review conducted in March 2004. The prime recommendation from this review was that
   - “The management and trustees of the IF assume a ‘foundation style’ mode of operation in a ‘foundation style’ entity”; they need to move away from just managing a fund and start building a bridge to sustainable economic growth.
   - The review also found that the Fund’s focus since 2002 on economic growth was a narrowing of focus in relation to the purpose of the fund as defined above, especially in the area of innovation.

We were told that the NRF executive has not responded to the fact that the IF is more interventionist and project management oriented rather than just grant management for external research. There needs to be an examination of how well the IF fits in the grant funding environment and synergies need to be built to accommodate it better.

Commercialisation and Intellectual Property Rights (IPR) challenges and issues are dominant in the Innovation Fund, which also creates the need for legal expertise in IP registration, patenting and contract drafting and commercial expertise in contract management are critical for the IF. The NRF’s new focus IF on the PhD as driver creates difficulties for the IF since it is a hard sell to Industry.

The panel recognizes the sources of tensions around the placement of the Innovation Fund in the NRF, and recommends that both IF management and RISA leadership take more active steps to create synergies between the IF and other NRF programmes for mutual benefit. Placement of the Fund elsewhere would weaken both.
IF management confirmed to the panel that they had put in management systems and controls in place to ensure that funds are used for their intent and that there is transparency in the process.

IF management acknowledges that there is still no concrete evidence on the impact the IF is having within the NSI but there is an increase in the number of associated patents being registered and there are several companies that have started up due to IF funding.

### 3.3.2 The Technology and Human Resources for Industry Programme (THRIP)

THRIP is another of the NRF successfully managed programmes. THRIP was founded by the Department of Trade and Industry (the dti) and is managed by the NRF, advised by the THRIP Board and sponsored by the dti. It supports projects that address the technology and human resources needs of industry on a cost sharing basis with industrial partners. The challenges that THRIP faces going into the immediate future are listed in the NRF Draft Business Plan as the following:

- Equity participation
- Advertising and Marketing
- Reduce amounts of unspent funds.

There was a THRIP review conducted in 2002 which dealt with issues in a comprehensive manner. Management’s response to this review (on p.23 of the evaluation report) accepted the need to improve administrative efficiency.

Most stakeholders interviewed by the panel on THRIP were positive on the impact that THRIP was having and appreciative of the contribution that THRIP is having on their research activities. There are indications that it could be considered the best performing of all the NRF business units.

Three major criticisms of THRIP were expressed:

- Its focus on the manufacturing industry as a result of it being a DTI initiated and supported program. There seems to be a feeling that its scope could be extended to include other areas such as it a model that is seen to be successful and has potential to be expanded and/or replicated. This would of course require additional funding for the programme;
- The co-funding required from partners. This especially came up in conversations with stakeholders from the ‘poorer’ institutions that often have to abandon projects because they cannot afford their expected share of funding;
- It seems to have been successful in the area of human resource development but not necessarily in technological innovation. This though a consideration should not be seen as a failure of the program as the primary aim is human resource development.
Though THRIP conducts thorough impact assessments, a question that the panel had that was not satisfactorily answered was if fund recipients, especially students, were tracked over a period to ascertain if they continue to do research and generally contribute to the national landscape.

### 3.3.3 Thuthuka

Thuthuka was initiated in 2001 by the NRF as a focused intervention to address the research and development needs of young black and/or female and disabled academics within the higher education sector. The aim was to accelerate the development of successful academic careers. The mandate of Thuthuka is to achieve the following from the designated group;

- Improve the qualification to doctoral and postdoctoral levels
- Contribute to the sustainable research capacity development
- Accelerate career progression
- Increase the number of NRF rated researchers

Being a new program, it has still not had a review but the Thuthuka associated people with whom the panel interacted with were very positive about the contribution Thuthuka is making in the area of capacity development amongst previously disadvantaged people.

The only critical issue identified was the fact that this is a co-funded programme (two-thirds must come from the institution). This level of co-funding is a challenge especially in the poorer institutions which unfortunately have the masses of those from the designated groups.

The concern from the panel is that this program is not mentioned in the Draft Business Plan and there seem to be no specific plans to measure its effectiveness and impact going into the future.

### 3.3.4 Institutional Research Development Program (IRDP)

The systemic acceptance of the notion that research capacity should be developed in ALL higher education institutions, albeit in a differentiated model (where niche focus areas are supported and developed as initial “drivers” in certain institutions and a broad range of synergistic, high-level research activity is fostered and enhanced in others with already established research cultures and reputations) will greatly assist the NRF in fulfilling its mandates. We support this approach as an affordable but strongly
developmental one which recognizes the importance throughout HE teaching and learning of the inspiration, insight, and mastery of content and practice which is acquired through research. (We believe that this principle is one which should be taken into account throughout the system in terms of policy and practices which may, or may not, bring about a separation of research activity from teaching and learning in the institutional context.)

The notion of "research capacity under-development" applies to both historically disadvantaged universities and the institutions that once were technikons but have now become universities of technology or been absorbed by universities to become comprehensive institutions. This means that the separate research development programmes of the NRF for these two categories have now appropriately been merged into a single, expanded program, at least at the level of the NRF’s new organizational structure, with an Executive Director heading the Institutional Capacity Development Program (ICD). It is good that the ICD sees its mandate as being inclusive of all institutions in the system (for example, helping to meet the needs of disadvantaged students in research-established institutions and National Research Facilities), but a special focus must surely be maintained on the needs and opportunities of the two (over-lapping) kinds of research-disadvantaged institutions on the new HE landscape.

We have not seen a strategic plan for the new, integrated approach to institutional research capacity development, and must assume that it is in the process of preparation, although the agenda finds extensive expression in the 2005/6 business plan of the NRF and especially in the RISA division, throughout its programmatic content and intentions. It is disturbing that no indication of the new programmes has been given to the affected institutions, which we were told are apparently in the dark about their status.

The panel found universal acclaim of the NRF’s crucial role in developing their research activity and culture over the last 5 years. That is a considerable achievement.

A key issue in the new HE landscape is the way in which disparate combinations of “old” institutions will either be expected to meet the research development needs through cross-subsidisation and internal programming or receive continuing support for their under-developed components, or can expect some kind of focused, continuing external assistance from agencies such as the NRF. Researchers in a comprehensive institution pleaded for teaching relief support to permit them to assist in the transfer of skills in the new context.

The Department of Education is implementing its new funding policies which include earmarked funding for planned research development for (whole) institutions which are assessed as falling below set benchmarks of research productivity. The above issue, and many others, will need to be addressed through coordinated harmonization of policy implementation in respect of policies such as the new Qualification Framework for HE and the Program and Qualifications Mix (PQM) (see above).

The NRF should be commended for the drive and imagination which has characterised its institutional research development initiatives. This is not to say that a multitude of issues do not exist that need resolution at the level of grantees and their institutional
research offices, and which will need to be looked at in consultation with the partner community.

### 3.3.5 Indigenous Knowledge Systems (IKS)

Indigenous Knowledge Systems have recognized economic and social as well as cultural value in South Africa. Indigenous knowledge can be useful in improving quality of life within South Africa, and may form the basis for increased productivity in agriculture and new export products. Parliament has paid particular attention to this area, and DST has an IKS unit. DST has ring-fenced R10 million annually for NRF to spend on research in IKS, but the NRF has been regularly unable to allocate that amount. An evaluation of the program in 2004 judged the NRF to have failed in this area, and broached the possibility of relocating the program if some fundamental changes were not made.

In our review, we have not done any independent assessment, but report here on some of the observations of the 2004 evaluation panel. No opportunity has been provided for management to respond.

The 2004 evaluation noted several problems. For example, indigenous communities and stakeholders are only marginally involved in the NRF program, except as informants. In some instances, indigenous community resources are being researched while the community is totally excluded. Involvement implies genuine integration at all levels in the process of research conceptualization, design, implementation and evaluation. It also means active participation and a fair and equitable share of the benefits that may accrue from the research.

In New Zealand, where there is a large indigenous community with rights established by treaty, indigenous research means research on topics chosen by indigenous communities and performed by indigenous researchers. The issue of who is in control is central. The review of the NRF program recommends “conscious departure from the tradition of favouring white institutions and researchers in the IKS research.” We confirm this recommendation based on international best practice as well as our own general recommendation that NRF build partnership relationships with stakeholder communities.

Many of the issues raised in the IKS evaluation also appeared in comments from applicants to other programs. For example, the evaluation noted that applications must follow the standard online procedure, and the review panels have been heavily weighted towards men and entirely composed of academics. Proposal evaluations departed from the stated criteria, and projects judged as inadequate by the review panel had been funded. Applicants received feedback that was “poor and disempowering.”

The feedback issue was also raised by many of the NRF applicants we interviewed. It is worth pointing out that this problem particularly damages applicants from disadvantaged backgrounds. Research in the United States has found that while white men may take criticism and come back with a revised application, female and black investigators are
more likely to give up on the system. If this is the result from high quality, careful critique, then it is even more likely to be the case when the feedback is badly prepared.

### 3.3.6 Bursaries

The Bursaries and Fellowships activity within the research capacity programmes is aiming to increase both the quantity and quality of postgraduate students across all fields of science and technology. The Department of Labour has increased the total amount available by providing bursaries in the scarce skills areas. In 2004, R31 million was made available in this form. Bursaries come in several forms: “free-standing” (see comments below), grant-linked, merit, redress, and scarce skills. The RISA self-evaluation reports that black participation has peaked at 58-60% while the share of women (no race indicated) has increased from 29% in 1999 to about 43% in 2004.

The NRF is struggling with the tradeoff between the number of students supported and the size of bursaries. The number and quality of applicants has been rising, but available funds have not been equal to the increased demand. Standardizing bursary amounts across categories resulted in fewer students being supported, and raising bursary amounts – a pressing need – will again reduce the number of students supported unless new funds are made available. Since training students is such a key feature of building capacity in the whole National Innovation System, steady, large increases in funding in this category should be the highest priority within RISA core funding.

We encountered significant problems in the implementation of the bursary schemes in our visits to campuses. We met with two large groups of postgraduate students, one in a more advantaged and one in a less advantaged institution. All but one of the students in the first institution were planning careers in industry, because salaries were better there. (The other wanted to go into public service in the health system.) About a quarter of the students in the second institution were planning on academic careers, drawing attention again to the importance of black students in replenishing the academic workforce.

The problems the students encountered with NRF bursaries were the same in both institutions, however:

- The bursaries, once awarded, are much too low, and there are not enough bursaries for honours students, who are at a key stage in their training. Bursaries for part-time masters students do not even cover fees. Students with families are particularly disadvantaged. NRF plans to increase the value of both masters and doctoral bursaries over the next few years, to R35 000 for master’s students and R50 000 for doctoral students. Other sources already pay more. Affluent institutions can “top-up” the low bursaries much more easily than less affluent ones.

- The submission date is not until August, and decisions are not made until November or later. This is much too late for students who do not get bursaries to
make other plans for funding for the year starting January 1. There are other sources of funding available, but these may take time to locate. The students we talked to had taken extraordinary measures to stay in school after finding that they did not have NRF funding, and the students who could not make such arrangements were obviously not in our meetings, having been lost to the system. Clearly, students from poor families are much less likely to be able to bridge than others.

• Submitting applications online is problematic for students from disadvantaged households or in disadvantaged institutions (as noted again in the NRF Online section below). Likewise, NRF’s reliance on email communication also assumes access to computing resources and email at all times – clearly not a reasonable assumption for this disadvantaged group.

• Although some bursaries are referred to as “free-standing,” the student must still specify a supervisor in the application form. Thus, the supervisor has a great deal of power over the student and personality conflicts may again cause a good student to be lost to the system. This situation could be rectified if free-standing bursaries were really portable.

• Students have no way of knowing whether their applications are complete, for example, whether their institutions have sent transcripts and whether all their letters of reference have been received. An online checklist could correct this easily. Because of the disparities in power between institutions, supervisors, and students (again, largest for students from disadvantaged groups or who are operating outside their native languages), relying on student assertiveness in these matters is disempowering to the very groups the programmes intend to draw in.

• NRF communicates only the positive results. Those who are not funded must watch the web site and read the list of those funded to find that their names are not there. Given that many very capable students are not funded, this is an unnecessary slap in the face to people who represent a scarce national resource. Instead of giving this rather cold treatment, NRF should be establishing a positive relationship with these students.

• The actual payments on awarded bursaries are reported sometimes to arrive very late, for example, in September or October for a bursary beginning January 1. Again, students from poor families cannot bridge this financial gap. This problem may not lie with NRF itself, but rather with the cumbersome system of email notifications and online approvals that involve supervisors or others on campuses. It is NRF’s responsibility to design a process that effectively gets the money to students on time, even if this involves more active reminders to those who must make approvals, followed up with phone calls as necessary.

• As a summary recommendation, the students asked for NRF to communicate directly with them, not putting their support at risk by communicating through institutions or grant-holders.
3.4 International Science Liaison (ISL)

The production of cutting-edge scientific research is driven increasingly by international networks of collaboration, exchange and debate. With the cessation of the academic boycott, international enthusiasm for working with South African research partners, and the high intellectual standing of many of the country’s researchers, South African research communities are well-positioned to enhance their global connectedness. The NRF has played, and should continue to play, a powerful role in this regard.

The primary institutional responsibility for promoting international linkages has been undertaken by the International Science Liaison division. It has had three sets of resources and instruments at its disposal. The first has been to implement and promote a series of bilateral and multilateral agreements negotiated with foreign governments by the DST and administered by the NRF. This function is overseen by the Science and Technology Agreements Committee (STAC), convened in 1996 by the then Department of Arts, Culture, Science and Technology to coordinate all multilateral and bilateral agreements for research collaboration. The second is to provide grants for the purposes of internationalising research. Third, the ISL manages the national International Council for Science (ICSU) committees and provide the necessary support for South African members to participate in ICSU activities.

We believe it is important that the NRF’s actively supports the internationalisation of South African research. The feedback from country representatives who collaborate with the NRF emphasizes and encourages the prospect of expanding such linkages further.

Interviews with the personnel associated with the NRF’s international initiatives suggest that they are seriously hindered by a lack of clarity about the coordination mechanisms. In line with the NRF’s mission, there is increasing commitment to building strong linkages with developing countries, including those in Africa. The fact that so few developing countries have active national research agencies, however, makes it unlikely that bilateral agreements alone will produce active research partnerships and linkages. Partly for this reason, the NRF has taken other steps aimed at prioritising the promotion of African research linkages. This includes Africa Interaction, a special fund to facilitate the interaction of South African academics in the rest of the continent. The RISA Self-Evaluation Report (2004) regards this initiative as having been seriously hamstrung by shortages of funding. Also, the NRF has initiated discussions to assist NEPAD in the establishment of the networks required for Global Change Research (GCR) across the continent.

Interviews with senior NRF staff suggest that there is scope for a more proactive strategy in relation to international partnerships generally, with careful attention paid to the specifically South African benefits and priorities. In some instances – such as Germany – foreign partners are specifically seeking direction to ensure that collaborative programs can be initiated to support the larger South African mandate.

Students who are able to visit other countries during their periods of postgraduate study benefit enormously from exposure to, and experience of the research culture in partner countries in these schemes.
Recommendation (13, in priority)
Review the mechanisms for coordination of South Africa’s international science liaisons, and expand the activity.

3.5 The rating system

As South Africa seeks to reposition itself within more global arenas of research and development, a robust and credible instrument for assessing research quality is an important aspect of knowledge production.

Research is assessed for quality in a number of different settings: in most countries, primarily in publication decisions for research journals, in proposal review processes for funding, and in promotion decisions in research-performing organizations. A few countries have separate systems for rating researchers, but in the two prominent cases of the UK and New Zealand, the ratings of individuals are part of the assessment of research quality for the purposes of allocating funds to higher education institutions. The South African system is unusual in its focus on the track records of individual researchers, rather than individuals as members of research teams. At present, the rating status is largely honorific, with the one important exception that eligibility for long-term (5 year) grants from the NRF is limited to rated scientists after an initial maximum of three two-year grants.

The national rating system was created by the FRD, in the early 1980s, as an attempt to produce a measure of research quality which foregrounds the ‘track record’ parameter in the evaluation of specific research proposals (RISA Self-Evaluation Report, 2004, p. 19). The idea was to use international benchmarks in evaluating the quality of a researcher’s recent output and reputation, in the belief that this would be a reliable predictor of likely scientific outputs, outcomes and impacts of the proposed research. Thus, well-rated scholars were allocated large grants in a system with top-down priority setting.

While well-established in the natural sciences, the extension of this rating system to other disciplines is more recent. Partly for this reason, and in view of the extent of the controversy surrounding the idea and operation of this system, it needs to be more thoroughly reviewed, revisiting its original purpose, the existing process model, the mechanisms for rating research, and the overall cost-effectiveness and utility of the system.

In doing so, close attention should be paid to a number of considerations which have been raised repeatedly during the course of this review:

* The extent of controversy and division provoked by the rating system.

The issue of the rating system came up in almost all the interviews we conducted, which exposed us to a range of strongly held and very divided positions. Some practitioners in
the system are ardent exponents, upholding it as a robust benchmark of quality, measured against the highest international standards, and an ‘ice-berg tip’ proxy for institutional research development. Others deem it unnecessary, unfair, unwieldy and divisive.

Despite recent increases, the number of rated researchers, as a proportion of the scholarly community, remains low – particularly outside the natural sciences. Of the approximately 15,000 scholars in the higher education sector, 1,324 are rated. Of these, 972 are in the natural science and engineering disciplines, and 352 in the social sciences and humanities (NRF Annual Report 2003-4, p. 29). There may be many reasons why these figures are so low, including unevenness in research track-record. But they also raise questions about the willingness of researchers across the board to participate in the system, and particularly in the social sciences and humanities (SSH). It is premature for the NRF to conclude that ‘despite some reservations still held by researchers within the system, there has been a very positive response by the SSH community in embracing this system’ (RISA Self-Evaluation Report, December 2004, p. 7). The views we heard expressed amongst researchers and ratings panel members also raise doubts about the extent of support for the rating system within other disciplines, including the natural sciences.

The fact of such high orders of controversy and division needs to be recognised. It is unlikely that a rating system can become fully credible and legitimate without greater orders of trust and buy-in, particularly amongst those eligible for rating. The proposed review of the rating system (see below) should therefore be as inclusive and responsive as possible to this diversity of views amongst scholars.

* Questions about the lack of coherence within the NRF’s research assessment instruments

Researchers and members of ratings panels perceive tensions between central aspects of the NRF’s Missions, and the current rating system. As a key aspect of its human capital Mission, the NRF wishes to reward and incentivise established researchers who draw younger scholars into bigger projects, in the interests of building research capacity and creating a lively research environment for groups or teams of researchers. This is not a criterion in the rating process, however. Indeed, the prioritisation of high quality international publications may create disincentives to leading researchers to take on mentoring responsibilities which detract from their time to write and publish internationally.

The NRF’s Missions also stress the importance of research which engages with the national developmental agenda, and its associated local debates and policy issues; but this does not bear on the ratings decisions. A high rating requires evidence of the international standing of the research. Yet, in many disciplines, established researchers have stressed to us the importance of contributing to and shaping local debates, engaged with critical developmental issues. With leading researchers writing for local journals, the international reach and impact of a piece of work may not be an appropriate yardstick of its scholarly quality. The case of law was often mentioned in this regard.
Questions about the lack of coherence between the various research quality assessment exercises undertaken by the NRF and the Department of Education.

The Department of Education’s research funding formula clearly prioritises and creates incentives for the publication of peer-reviewed articles in accredited journals, whether listed in international data-bases or in the Department’s own list of accredited South African journals. From this vantage point, producing books - particularly single-authored monographs based on many years’ worth of research – becomes a poor option, given the paucity of the reward relative to the time and effort involved. Yet in many disciplines - particularly the humanities and social sciences - the monograph remains the gold standard. This is reflected in the rating system, so that the lack of a book/s makes a high rating unlikely, if not impossible.

* The relationship between rating and funding

A source of much concern amongst established researchers is the NRF’s decision to de-link the rating exercise from decisions on research funding. Whereas in the past, a high rating guaranteed access to large amounts of research funding over the course of several years, the NRF now awards project funding primarily on the basis of the quality and merits of the research proposal, in conjunction with considerations about the race, age and gender of the applicant (RISA Self-Evaluation Report, 2004, p. 19). The rating aspect is now primarily deployed only as the eligibility criterion for five-year grants.

On the question of whether to re-instate the link between rating and funding, opinion was divided. Some supported the idea, as a way of rejuvenating interest among researchers in being rated; others opposed it, on the grounds that re-instating the link would undermine the NRF’s efforts to spread research funding more widely across historically disadvantaged groups and to younger scholars who have not yet become established researchers.

* Unevenness in the rating instruments used

A researcher’s rating requires evidence of international standing in his or her field of study. During our interviews with members of rating panels, we heard significantly different versions of how the question of international standing was interpreted within and between ratings panels. We were told that international reviewers too, did not necessarily share the same understanding of how to measure and report on an applicant’s international standing. In some instances, the impact factor of the journals in which the applicant publishes is uppermost; in others, there is a more composite assessment of international reputation; in yet others, there is more of an emphasis on judgments of the quality of the published work.

* Difficulties associated with a ‘one size fits all’ model for ratings

While some panel conveners felt that standardisation of the ‘track record’ assessment across disciplines was essential, most drew our attention to problems which have arisen in extending a rating system developed for the natural sciences many decades ago, to different disciplines and new research styles and modes of inquiry.

Some perceived a bias towards the natural sciences in the emphasis which some international reviewers and panelists place on measurable indices of research impact. In the absence of such instruments in the social sciences and humanities, the ratings
process is seen to be subject to the individual perceptions of selected reviewers; personality differences and personal relationships on ratings panels; as well as ideological conflicts within fields of study, particularly within relatively small research communities. It should be added, however, that the problem of subjective judgments seeping into the rating process was also raised more generically, affecting the natural sciences along with other disciplines, as a function of the inevitable prejudices and biases which shape judgments of peers, often subliminally – a problem which all rating systems have to confront.

Our attention was also drawn to the particular difficulties in rating the outputs and impact of the work of scholars in the creative and performing arts. Some people working in the more applied disciplines, such as engineering, also feel that the rating system undervalues their kind of work.

* Concerns about systemic sources of bias

Responses from various researchers, particular in newer fields of scientific inquiry, perceived the rating system as valourising a 'one person, one paper' model of research output, at the expense of more team-based and multi-authored publications. Even in a single discipline, the bias is towards long-term involvement in a single area (“hedgehogs”) as opposed to equally able scholars who migrate across a number of topics in their careers (“foxes”).

The rating system was designed for discipline-based work, and is less well-adapted for interdisciplinary research. Even in discipline-based research, the system is biased in favour of people working in narrowly defined fields. It is more difficult to be rated as within the top 5% of a field internationally, if the field itself is vast – which many perceive to be unfair. This kind of measure of international standing may not therefore be the appropriate proxy for the international quality of the research.

* Various operational problems with the current system

Our discussions with members and conveners of ratings panels drew our attention to several obstacles to an objective application of the criteria for rating, including unevenness in the ways in which different panels interpreted the criteria for rating; difficulties in interpreting the subtle differences between ratings within a particular category (e.g. C1 as opposed to C 2 and C3); difficulties in finding local reviewers who don’t know the applicant personally; and the tendency among reviewers (especially international ones) to interpret their briefs differently, and with insufficient knowledge of the local context.

Feedback from researchers also raised concern about the powers of the NRF Executive to override recommendations from panels in respect of A ratings. Many commented too, on the inadequate feedback provided to applicants; the relatively short time period in a scholar’s career on which the rating is based; and an overly onerous process of application – compounded by problems with the on-line system. Some of the information requested (e.g. in relation to all graduate students supervised, and where they are now) is time-consuming to assemble, yet it is not taken into account in deciding the rating.
Many ratings panel members we interviewed expressed their doubts about the schema currently used to classify researchers. In South African higher education institutions, a C is invariably associated with a grading of 60%, which is assigned to a less than impressive piece of work. So, being assigned a C rating is perceived as a failure – irrespective of the intentions of the system. Alternative suggestions include switching to a numerical scale (1 – 6) or simply differentiating between internationally rated, nationally rated, and new researchers.

As a review panel, we are skeptical about the merits of the NRF’s rating system, and we are in unanimous agreement that a fully merit-driven competitive process of awarding NRF grants on the basis of proposals, weighing track records into the evaluation, would be an improvement on the current NRF policy of using ratings as a gateway to longer-term and continuing funding.

We believe, however, that decisions about a rating system should not be imposed; rather, a decisive verdict on the NRF’s rating system should come from within the country’s research communities, in consultation with other stakeholders.

A credible and legitimate rating system will depend on high levels of support among its subscribers. In view of the extent of controversy and mistrust associated with the current rating system, we therefore recommend the appointment of a sector-driven task group, to reconsider the rating system.

This task group should be convened by, and largely drawn from within, the scholarly community, with representation from the NRF and other stakeholders, and should report to the NRF. One possible mechanism for instituting this review might be to conduct it under the auspice of the newly formed HESA (Higher Education South Africa).

This exercise should be as inclusive as possible, with opportunities for all stakeholders to express their views. We also recommend that the task group be open to other possible models of rating and research evaluation, by looking more closely at the experiences of other countries, but caution against the danger of simply importing a new model from the outside without taking cognisance of the specific circumstances of research, development, and higher education in this country.

**Recommendation (9, in priority)**

a. A sector-driven task group should reconsider the rating system, in terms of its fundamental purpose and utility; and

b. The Higher Education sector should convene this task group, invite input from all stakeholders, and report to the NRF.

### 3.6 South African Agency for Science and Technology Advancement (SAASTA)
SAASTA is a recent addition to the NRF “stable” with residual links to the DST relating to science promotion work done on the latter’s behalf, with the agreement of the NRF management. While we think that SAASTA is in many ways a suitable complement to the NRF’s core grant-making and especially to the National Research Facilities (see above), we are concerned that it may find itself operating in a large “sea” of already launched, similar activities in both the private and public sectors. One may, on the other hand, find that SAASTA can benefit from the singular positioning and reputation of the NRF as the dominant player in the support and development of research activities at South African institutions, and imaginative leadership of the country’s research system by the NRF can find expression in the imminent expansion of the activities of SAASTA. The complementarity between the NRF’s National Research Facilities and SAASTA, and the specific development of contrasting science promotion centres at the National Zoological Gardens in Pretoria (the macro-life science of animals) and the old Johannesburg Observatory (astronomy and physics) is very promising in terms of the overdue transformation of the productive scientific workforce in South Africa, acting at source, as it were. There is obvious room for productive partnerships which can enhance SAASTA’s work, for example, with the Department of Education and its provincial counterparts, the Academy of Science of South Africa, industry and international agencies.

3.7 Research infrastructure and the National Research Facilities

This section deals with two related topics, reflected in the title given by the NRF to the responsibility area of the new Vice-President’s position, and the fulfillment of the core mandate of the Foundation to provide, as far as possible, appropriate and adequate infrastructure for South Africa’s research community. The failure of the State, through both its line departments of Education and Science and Technology, to maintain the equipment base of the country’s research-active institutions has severely impacted on their competitiveness, as evidenced in many studies of the outputs of the system as a whole.

3.7.1 Adoption of a National Key Research and Technology Infrastructure Strategy

The imminent adoption of a well-conceived strategy (launched by the DST and the NRF in July, 2004) to re-invest appropriately in the country’s equipment infrastructure represents a milestone in the NRF’s ability to meet its mandate in a more balanced and coherent manner.

Equipment is classified into items that are

- needed in a “well-found laboratory”;
represent world-class and multi-user facilities in both an institutional and regional/national context, and

"big, expensive facilities" which in turn can be national (either declared National Facilities operated by the NRF or hosted by other institutions) or international (where mega-science facilities are hosted in South Africa for geographic or other reasons).

We strongly support the early implementation of the National Key Research and Technology Infrastructure Strategy, including the proposed "catch up" contribution to in-house “well-found laboratories” in South Africa’s research-active institutions. The phased introduction of different categories of equipment as outlined in the Strategy will produce an orderly set of planning principles into the system.

There are obvious implications for the NRF in being identified as the agency that will implement the Key Equipment Strategy. While this falls naturally in the mandate of the NRF and its track record suggests the job can be done, the ensuing demands on management and support staff in the organisation may be considerable in the light of the well-planned, comprehensive response required by the Strategy.

### 3.7.2 The National Research Facilities

The set of 7 National Research Facilities operated by the NRF have been formally grouped into three clusters in recent documentation emanating from the Foundation. (While the expected operational consequences of this promising approach have apparently not yet taken shape within the organization, a 4-page document recently drawn up on behalf of the Astro-Geosciences cluster well illustrates the potential benefits that could be obtained both in the areas of strategic planning and budget development, on the one hand, and synergies in fulfilling the NRF mandates, on the other.)

The criteria for National Research Facilities as listed in the 2003/4 NRF Annual Report are as follows:

- they should have unique position in South Africa’s knowledge production;
- the core technologies, research methods or data pools/collections should live up to international standards;
- their goals should be well aligned with the overall objectives of the NSI;
- they should have a critical mass of equipment, skills and users;
- they must have potential for networking and attracting international collaborators to South Africa;
- they must offer opportunities for human resource development in a transformational context; and
- they must provide opportunities for the advancement of science and for the interface between science and society.
In this section we examine a number of issues that relate to
- generic issues about the National Research Facilities;
- NRF management of these functions; and
- problem areas in specific facilities.

The present National Research Facilities are distributed across the country at a distance from the NRF headquarters. They are expensive to operate and sustain, and from their very nature (combining highly specialized, creative people and costly and complex equipment) require a firm kind of “hands on, fingers off” management from the executive center of the NRF plus some kind of focused and capable advisory body. The National Research Facilities also tend to have complex international dimensions in terms of co-funding partnerships, equipment construction and visitor exchanges, that would in general be unusual for university-based enterprises. The issue of possible mission drift accordingly arises if the total agenda of the National Research Facilities is allowed to increase so that the core NRF business of external grant-making and facilitation is negatively affected, arising from competition for executive time and focus, as well as budget.

The issue of limits to the scope of National Facilities came up when the Review Panel interviewed the directors of various consolidated and regional museums, falling (as declared cultural institutions) under the Department of Arts and Culture. Why should certain “national science/research facilities” within the museum system that probably meet most or all of the requirements for becoming NRF National Research Facilities and are running the risk of a regression of research activity, not be candidates for inclusion in the NRF “stable”? The question was left open.

The overall impression obtained from the final specialist-panel reviews of the four most established National Facilities (iThemba, the SAAO, HartRAO and the HMO, all in the physical sciences) is that each can be presented as contributing to the NRF’s core mandates in a way that not only extends the scope of what kinds of research can be done in the country and the continent, but also provides a lever for foreign co-funding and collaboration, and inspires the country’s young people to believe in their own possibilities and to act on that in terms of career commitment. This impression is tempered by the fact that in one case (iThemba LABS) there is a built-in link to a commercial production process and a high-end medical treatment facility that severely limits the amount of research that can be done by in-house scientists, local users and international collaborators. In this case, and in that of some others, the problem of being cutting-edge and world-class in the face of uncertainty about budgets is a cause of concern and a potential source of conflict within the NRF.

The decision to create and fill a new post of Vice-President for research infrastructure and the National Facilities may go some way to permitting this segment of NRF operations to be managed more effectively, and in a more business-like manner, than is currently the case. Establishing advisory boards or councils for each of the Facilities in these two clusters will also help to prevent or resolve the kinds of problems that can easily arise in enterprises of this type. An additional contribution would come from the solution of some of the organizational issues (like problematic bursary levels) that seem
presently to prevent some postgraduate students from making use of study opportunities at the National Facilities.

There is of course an inherent conflict of interest for the NRF in being simultaneously an impartial grant-maker and the operator of a set of own facilities that compete for a pool of limited funding in the system. This needs careful attention.

The newer National Facilities in the Biodiversity and Conservation cluster are somewhat different from the ones in the clusters mentioned above. Two (SAIAD and the National Zoological Gardens) are migrants from the large group of declared cultural institutions falling under the Department of Arts and Culture, while the third (SAEON) as an “emerging” National Facility represents a very different and imaginative variant of the National Research Facilities model. (It is being set up in a form of a distributed network of environment-monitoring activities connected to continental and global networks that are likely to be very important for the country’s prosperity in the medium- to long-term future.) In the case of the National Zoological Gardens, the due-diligence and international fact-finding exercise that preceded the declaration of a National Facility permitted the development of a visionary model of a world-class “research zoo” combined with an appropriate science centre; realisation of this vision will, however, not be uncomplicated, and will depend on the goodwill and cooperation of HE institutions that also active at a high level in this field. SAIAB, while much more established and specialized, is more akin to the museum-based, collection-focused institutions already mentioned above, and in addition poses the question as to how it will, or should relate to the new South African National Biodiversity Institute (SANBI) which falls under the Department of Environmental Affairs and Tourism (DEAT).

It is clear that the potential size of the total “National Research Facility” sector in South Africa is large if one uses the definition used by the DST and the NRF, as quoted above. The fact that some of the entities such as the research-active museums are situated in the domain of the Department of Arts and Culture and some in that of the Department of Environmental Affairs and Tourism does not mean that a common and cooperative approach should not be negotiated between the departments concerned, in order to serve a national goal in synergistic and ordered ways. The NRF has pioneered a multi-purpose approach to these unique national assets that can be propagated across the system without requiring the NRF ultimately to absorb all of them.

We have assessed the National Research Facilities model against the NRF mandates as follows:

* The entities all contribute directly, through deliberate actions, to at least three of the “Missions” of the NRF - high-level skills, knowledge production and infrastructure for research. (The fourth, technology innovation from new knowledge, is less applicable but feasible in some instances).

* The availability of National Research Facilities enhances both the scope and effectiveness of the “Missions” to ensure that the pool of new skills is sufficiently diverse to play the multitude of existing and (unpredictable) new roles required in a rapidly changing world (despite the high opportunity cost).
* National Research Facilities are rational in that they concentrate national effort and expenditure in one place (or network), so that internationally competitive facilities are affordably made available in a (multi) user-accessible and sustainable way, to both a national and international user community.

* National Research Facilities in South Africa can leverage extensive international co-funding, especially if their Pan-African significance is emphasized and deliberately fostered.

* National Research Facilities can, if effectively marketed, generate pride in the country’s abilities and motivate many young people to achieve the maximum of their potential.

* The concept of “National Research Facilities” is sufficiently flexible to permit their establishment in a range of disciplinary contexts, although the primary definition of being a deliberately created and sustained, unique, expensive and multi-accessible national entity must be met in each case to avoid stifling the creativity and diversity of HE institution-based research enterprises.

* While the nationally significant “Missions” of the NRF can readily be met in operating a National Research Facility, there is no doubt that this requires conscious planning and effective direction to be achieved in practice.

* Maximum synergy between NRF programmes seeking to generate diverse skills and a broad range of new knowledge, on the one hand, and a SMALL set of well-selected and –operated National Research Facilities (also diverse and extending to the human/social sciences) on the other, will make it more likely that the “Missions” of the NRF will be achieved in terms of the desired outputs, outcomes and impact.

* Because of their cost and associated high risk, National Research Facilities need to be established with considerable care, in a framework which prevents ad hoc decision-making and agenda-driven planning; they must be fully justified in the light of the above considerations, in order to minimise huge opportunity costs and fruitless expenditure. They must also be predominantly research-driven and not primarily technological in nature, although advanced technology is itself a desirable form of high-level skill.

* As they live and die by their productivity, the work of National Facilities needs to be peer-reviewed, first, and strategically managed to ensure the achievement of the NRF “Missions”, second.

* The total number (and nature) of National Research Facilities operated by the NRF must necessarily be limited by considerations that are based on the above approach, in which their primary purpose is to play an integral role in the achievement of the NRF “Missions”, rather than in some other, unrelated context.

* The involvement of international scientists and interests in the National Research Facilities should be handled in a manner analogous to the leverage of funding, i.e. the development of high-level South African scientists, especially black people and women, should deliberately be maximised through the international participation and interaction.
* While National Research Facilities lend themselves particularly powerfully to favourable profiling of South Africa’s increasing scientific capability, care needs to be taken to avoid the perception of expensive “white elephants” depriving a multitude of equally productive smaller and more diverse enterprises of appropriate resourcing.

* The idea of making possible the use of locally unaffordable mega-facilities abroad to further enhance the scope and diversity of South Africa’s high-level scientific person power is logical and feasible in the current international geopolitical climate.

We have observed some tension between the DST’s powerful driving of the model of National Research Facilities and the NRF’s role as the agency implementing and overseeing their development. Ring-fencing of the budget annually awarded for the National Research Facilities does not appear to be in place, exposing the individual entities to pressure as part of the NRF budget process. (The alternative model of having external organizations operate the Facilities under contract might mitigate some of these problems.) There seems to be every reason to regard the strategic planning and budgetary provision for the National Research Facilities as a continuous, joint responsibility of the DST and the NRF Board and Executive. The NRF Board, in particular, would be a critical discretionary custodian of the balance between core NRF grant-making activity and the size and scope of the NRF-operated National Research Facilities.

We are unable to adjudicate the contentious issue of the possible establishment of a Major Radiation Medicine Centre (MRMC) at iThemba LABS near Cape Town. While foreign funding may be found for the setting up of this Centre, sustainability issues appear to be unresolved, and caution is obviously indicated, which is not to say that the idea is unrealistic or inappropriate, only that certain guarantees have still to be put in place. The transfer to iThemba LABS of the prestigious Schonland Centre as a Northern satellite, on the other, appears to be wholly advantageous. The recent appointment of a Director of this new component, in the face of the Review Panel’s recommendation to the contrary, is a worrying sign that Review Panels working in good faith for the good of the organization, may tend to be ignored with impunity in the NRF system, something this Review Panel finds disturbing for obvious reasons.

In summary, we find that while the NRF’s stable of National Research Facilities is impressive in terms of a national assertion of scientific determination, we are not sure that the criteria for the establishment of the Facilities (see above) are sufficiently clear to provide a natural limitation to the size and scope of the sub-system within the NRF’s core mandate. It is not clear that the larger science community has been involved in the debate about the limits and special place of the Facilities. Some kind of limit is imposed by the proposals for funding of the kinds of equipment required by National Research Facilities but this will hardly be a determining factor in the debate.
Recommendation (8, in priority)

a. The challenges posed to the NRF’s mission and goals by the National Research Facilities should be the subject of a national discussion on investment in, and choice of National Facilities, including clear criteria; and

b. the NRF Board should consider the pro’s and con’s of NRF’s direct management of the National Research Facilities, including
   - having an advisory board or council in place at some or all the Facilities;
   - semi-independence through an appropriate governance model; or
   - contracting out for the management of some or all the Facilities.
4 INTERNAL ISSUES: HUMAN RESOURCES, TRANSFORMATION AND KNOWLEDGE MANAGEMENT

Human capital management and development is one of the core Missions of the NRF within the National System of Innovation. The different initiatives undertaken by the organisation signify that the drive to continuously grow and develop its people is also important. The NRF business units have different human capital challenges and needs, covered in the respective business unit review reports. This section concentrates on the Research and Innovation Support and Advancement (RISA) business unit.

4.1 People management

The general feeling from interviews with both staff and external stakeholders is that the NRF provides a good physical environment to work in and that the work done by the organization is of national importance and has an impact on a lot of people in South Africa, especially those who need it most who were previously discriminated against during the apartheid era. External stakeholders find the people at the NRF to be friendly and helpful.

There are undoubtedly issues and challenges which from the external stakeholder perspective have to do with NRF processes and policies, with the knowledge and experience levels of some of the staff, and especially with the attrition and movement of staff.

The fact that the NRF has been tasked with taking on additional responsibility for complex programmes, such as THRIP by the dti; the Innovation Fund by the Department of Science and Technology; and the Scarce Skills Development Fund by the Department of Labour, indicates that good work has been, and is being, done by the people in the NRF. It also means that a variety of tough challenges have been added to their workloads. This has resulted in a number of human capital issues being highlighted in the group sessions that members of the panel had with various members of staff; in the Stakeholder Survey conducted by Marketing Surveys and Statistical Analysis at the end of 2004, and particularly in the RISA and SASTA Climate and Culture Audit Report which is part of the culture change process initiated by the NRF executive team.

Most of the issues that will be highlighted in this report are known to the NRF management and are included in the NRF Corporate Overview of December 2004, section 5, Human Resources, pages 32–35. There are already initiatives in place to address some of them and these are highlighted in both the Key Performance Indicator Report 2003/2004, pages 43–45, and in the NRF Business Plan 2005/2006 – 2007/08, pages 61-62.

The challenge of creating a common culture after the merging of the Foundation for Research and Development (FRD), and the Centre for Science Development (CSD) of the Human Sciences Resource Centre (HSRC) has been aggravated by the high...
turnover rate of staff and the need to transform the organisation profile (race and gender) which will take years of concerted, sustained effort to achieve.

Change resilience is going to be a key competency that will need to be developed amongst all employees at the NRF to enable them to cope better with the many changes taking place both internally to the NRF and the South African Research landscape. The establishment of an appropriately staffed organisational development department should be considered.

It is important that human capital challenges are dealt with in a holistic rather than on a program by programme-by-programme or issue-by issue manner, and that a thorough analysis is done that includes external as well as internal considerations.

It is evident that there has been general staff dissatisfaction with the way things have been done, and this has been loosely translated to implicate the management style in the organisation with accusations of an “us (workers) and them (managers)” culture. Issues of trust clearly need to be addressed. The highlighted specific problem areas are the following:

- **Consultation and Communication**
  Consultation and communication channels have been found either not to exist, or to be clear, or to be consistent. There has been a lack of transparency in the way decisions have been made, and staff and middle management desire more involvement and consultation as stakeholders and the people that are most affected by changes. Efforts should be put in place to improve communication and initiatives established for employees to feel valued in the organisation; this should be done to support the initiatives implemented from the culture change process.

- **Policy implementation**
  Though some evidently good systems and policies have been introduced at the NRF, such as its Performance Management System the use of these has been found to be “optional”, leading to some departments not implementing them. The implementation of the programs should be accelerated across the organization. A grading System should either be put in place or, if it already exists, should be communicated in a transparent manner to management and staff, and processes put in place to ensure common understanding and application. The remuneration policy should also be shared with staff in a transparent manner without compromising individuals.

- **Human Resources processes**
  These were found generally not to be working satisfactorily. An example was the issue of staff development where the general feeling was that staff got “developed” based on the standing of their particular manager with executive management. Feedback on this from the focus groups was inconsistent in that some were very grateful for the development opportunities accorded to them and some claimed that they have had request after request for development declined. There was also concern that the staff development budget had been centralized.
under the division of Human Resources and was not equitably distributed, with uncertainty as to what staff training could or should be done. Some managers had apparently used operational budgets to send their staff on training and development courses. Training and development guidelines should be communicated in a transparent and equitable manner, and managers should have input into how the funds were spent.

A Skills/Talent Management process and system should be developed and implemented as a matter of urgency, to address both the issue of high attrition and that of career planning and management. This should include an examination of the recruitment practices and induction into the institution.

- **Work-Life balance**

The slow rate of replacement of staff members who have either been promoted or have resigned, and restructuring where jobs have sometimes been merged, has meant that some staff members have had to take on huge workloads. This is leading to dissatisfaction as the incidence of overtime and weekend work increases, leaving little time for family and other activities. This is also leading to increased levels of stress in an already stressful environment. An initiative should be put in place to address health and wellness issues, and a drive to promote work/life balance initiated, especially in areas most affected by staff shortages.

- **Remuneration**

There have been some accusations of inconsistencies in the area of remuneration; people at the same levels are said to be getting significantly different salaries.

- **Reward and recognition**

There is a need for staff to be recognised and rewarded for “going the extra mile”. At the moment, depending on who the manager is, one might or might not get some acknowledgement. An awards system if not already in place should be established to ensure that employees who perform well are recognized.

- **Attrition**

There are currently very high attrition rates amongst middle management and professional staff to a point where continuity and sustainability is being threatened. This came up both in external stakeholder interviews and focus group sessions as well who complained that despite the fact that NRF employees are generally very friendly and helpful, one can never be sure of speaking to the same person when there was a need to communicate with the NRF. All aspects that lead to the high attrition rate should be analysed, and a strategy put in place to address them and also to create an enabling working environment. This should be done to complement the initiatives that will emanate from the culture change process.

- **Induction**
There is apparently no formal induction program to ensure that new employees, especially at management levels, are brought up to speed quickly and efficiently to ensure that they become effective in their jobs. Due to the complex nature of the NRF operations and functions this issues is critical and is exacerbated by the high attrition rates already mentioned.

- Succession planning

Because of the current high rate of turnover of employees in the NRF, succession planning is necessary not just in the executive ranks but also amongst the professionals and middle management. Some employees feel that due to this not being in place they are being overlooked for promotion opportunities.

- Psychological contract

The psychological contract between some new entrants and the organisation was not consistent in certain cases when employees accepted jobs in the NRF expecting to perform research and find that instead their jobs mainly or only involves research management and fund administration. This often led to disillusionment and sometimes anger and resentment accompanied by accusations of misrepresentation.

Conditions of Service in general seem not to be an issue; no criticism was expressed in the areas of pension, medical aid, leave, etc. The only complaint in this area was that HR staff could sometimes not assist in explaining and clarifying these and that when sessions were organised to discuss them the notifications / invitations were not effective or inclusive; an example given in a focus group session was when the Medical Aid provider came to clarify certain medical aid issues to the NRF staff.

### 4.2 Restructuring and transformation

NRF recognises the need to remain dynamic. Support for an orientation to change appears in the expectation from the System Wide Review of 1999 that science, engineering, and technology institutions would "undertake studies of their own organisational cultures and of the way they learn (or fail to do so)", to be facilitated by external expertise" (Kriger, p.10)

A commitment to organisational innovation and learning appears in the NRF business plan: "As the NRF has the responsibility to become a knowledge organisation with a clear understanding of its role in the NSI, it is imperative that the organisation transforms itself internally and externally and becomes and remains innovative and spends the necessary resources to enhance learning." (NRF Business Plan 2003/04-2005/06, p. 55).

Undoubtedly, the structural changes NRF has made over its brief history reflect its interest in innovativeness and continuous learning. Yet, several conditions potentially reduce the effectiveness of the restructuring: (1) the frequency of large-scale restructuring; (2) inadequacies in determining and conveying the objectives of the
changes; and (3) limited assessment of correlates and consequences of effective restructuring.

Over its relatively short history, NRF has undertaken three overall changes in its organizational structure of different scope and impact on employees. The frequency of these changes, coupled with turnover in staff, has often left relatively little time for adjustment to and assessment of the changes. Rather than signaling a culture of innovation, the changes suggest to some instability of operations.

The above-mentioned NRF business plan also states that "sound decisions should be supported through effective and efficient business processes and procedures, open internal and external communication." (p. 32). Apparently, restructuring has not always engaged all of the entities responsible for effective outcomes. Moreover, limited communication about the plans and reasons for restructuring generates uncertainty and - at times - resistance.

NRF seeks to become "a knowledge organisation where a coordinated and efficient knowledge management system supports and facilitates the achievement of organisational goals." (NRF Business Plan 2003/4 – 2005/6, p.29). The achievement of this end seemingly requires the mobilization of all resources, including those linked to evaluation.

In addition to the areas already identified for action in the NRF Business Plan, there is a need to Review results of the audit of the NRF culture, to identify effects of restructuring and lessons for achieving effective organisational change. Added to this would be an immediate change management initiative to do damage repair and address whatever retention issues that have been identified into consideration and concentrate on addressing those.

Recommendation (5 in priority)

Act urgently on human capital issues:

a. Make concrete plans for retention of program staff.
b. Act on the culture and climate audit report.
c. Consult genuinely around internal decision-making.
d. Increase investment in training and open career paths.
e. Embed internal transformation.

4.3 Knowledge management and strategy

In its founding Act, NRF was given several knowledge management tasks: “evaluate the status and needs of research”, “compile and maintain a national registry of research funded by the Foundation”, and “promote the provision of an information infrastructure linking research institutions to facilitate cooperation and sharing of research information
and knowledge.” Recognizing the importance of information and its management for effective organizational development, the Knowledge Management and Strategy Directorate (KMS) was established in 2000. KMS is located in the Research and Innovation Support Agency, but serves cross-cutting functions for the organization. Support functions provided through KMS include IT services and tools and (recently added) central grants management. The Directorate also includes the Evaluation Centre and a unit for Information and Strategy Advice.

Two of the most emotion-charged topics we encountered in the review fall within the work of the Knowledge Management and Strategy Directorate: the rating system for individual researchers, which is coordinated in the Evaluation Centre; and the introduction of the NRF Online system. The review team has already commented on the rating system above. This section includes a discussion of NRF Online. As requested in the terms of reference, it also comments on evaluation, monitoring, and performance indicators, and the establishment of a review culture within the organization. Finally, it addresses the extent to which management information support systems enable the strategic leadership required in the achievement of the objectives of the NRF.

4.3.1 NRF Online

The RISA self evaluation we received as part of this review includes the following short statement:

NRF Online project delays due to workflow and numerous problems experienced by users with the initial deployment of the system which impacted very negatively on the image of the NRF are being attended to as a matter of priority.

The review team applauds the level of accountability this statement represents, and which was also expressed by the manager of the IT unit in our interviews.

The NRF Online system is a complicated project intended to create an all-electronic interface to the application process for grant applicants and reviewers and to grant processing and results information for internal program staff. When it is completed and operating, it will be a powerful tool for integrating information and processes in many parts of the organization. The system as designed compares very favorably with the best such systems in other countries.

Unfortunately, the implementation of the system was rushed and applied to too many programs too early without adequate testing. A large number of applicants and reviewers at key points in the grant cycle in 2004 were not able to complete the necessary submissions in the system. This caused a huge tidal wave of frustration on the part of both external users of the system and the internal helpdesk staff, putting everyone under stress. Judging by the reports we received, the problems may have undermined the review processes for bursaries, project grants, and institutional research development activities through at least one round. NRF has backtracked, and is now re-introducing the system in a more phased and tested approach.
It is difficult to assess, however, exactly how much damage has been done to NRF’s relationship with the research community and to the community itself as a result of the initial disastrous phase of this project. From our interviews, we believe the damage is substantial. We were told more than once that some researchers gave up forever on NRF after their experiences. Students may have been lost to research permanently as a result of glitches in processing bursary applications or because reference letters could not be submitted. The damage in relationships with the research community has probably been magnified in light of the already high level of frustration with the high costs and limited benefits of NRF support for researchers and students, as reviewed in the section above on transaction costs.

The review team sees the experience with NRF Online as another example of lack of appropriate partnerships and working relationships with institutions of higher education, and of a top-down, non-consultative approach. If the project had been developed collaboratively with a set of test institutions, the importance of moving slowly would have been clearer and testing would probably have been more complete. Internal testing is not enough; campuses have their own IT infrastructures, which may or may not perform the same way NRF’s does. There is still a major need for NRF to work with campuses on getting research support offices, researchers, and students up to speed on how to use the system effectively. Leaving institutions of higher education to fend for themselves to incorporate the system into their processes will only cause further irritation and damage. A cooperative effort must be undertaken quickly.

Furthermore, NRF seems to be undermining its own value of redress and equity in moving to this entirely online system. We heard from students from disadvantaged backgrounds that getting access to computers to submit their applications was difficult to impossible, through crowded computer labs on disadvantaged campuses. The historically disadvantaged institutions are likely not to have as good information infrastructure as the wealthier institutions, and therefore may take more partnership investment to get up to speed with NRF Online. The point is not that an online system is not appropriate, but rather that NRF must consciously concentrate efforts on getting users from disadvantaged backgrounds onto the system. If not, it is exacerbating existing inequalities.

**Recommendation (4, in priority)**

**Restore the core business processes to full functionality:**

a. Work with key stakeholders.

b. Set timelines to fit stakeholder schedules.

c. Train internally and externally for IT system changes.

d. Do trials at stakeholder locations for new systems before full implementation.
4.3.2 Evaluation, monitoring, performance indicators

There is substantial evidence that NRF has developed a “review culture.” Many programs have been evaluated, and performance measurement is receiving attention in many parts of the organization.

NRF commissions a large number of external reviews and evaluations at programme level. Each of the national facilities has been reviewed, with the exception of the most recently acquired. The Innovation Fund and THRIP have been evaluated. The institutional research development programs have also been evaluated, including both the technikon program and the HBU program. Like some other research-supporting organizations, however, the pattern has been to evaluate programs and activities outside the core and to leave the performance of core activities unexamined. Thuthuka, the bursaries, and the Focus Area Programmes have not received external evaluation yet.

NRF has developed a standard format for its reviews and evaluations. Programs are generally reviewed about five years into their operation, allowing time for some results to appear from funded work. A reference group sets the terms for the review. Self-evaluation of the unit under consideration is generally the first phase of work. An independent review panel is appointed, including international members. The review or evaluation team then receives a large stack of documents to review (one team measured 12.5 kilos per team member). They gather in Pretoria and interview key parties. A limited amount of time is provided to write a report, which is then delivered publicly, with a private session with the reference group following. Management then responds, and the Board receives both review and response. Unfortunately, many panel recommendations seem to be dismissed in the response process or ignored in implementation; for example, in the recent review of iThemba Labs (see the National Facilities discussion).

Our review team wishes to point out that the advance preparation of the evaluation team is crucial to the success of such reviews. The panel chair should meet with the reference group 6-8 weeks ahead of the review period, then engage the rest of the panel on definition of the key issues in a conference call at least a month ahead. At that time, the team should examine the schedule for the review to make it realistic and focused and to request data and interviews. The team should be scheduled for an initial meeting of at least a half day before any interviews start, to develop questions for each set of interviews.

NRF’s reviews and evaluations rely on quantitative information about inputs, activities, and outputs as much as is possible given the age of the programs and the current state of data. Output information, usually on students graduated and papers published, is frequently included. The 2004 evaluation of the Innovation Fund is a notable exception, although that program has its own set of observable outcomes that could have been reported. The THRIP evaluation panel recommended gathering more data on impacts, and the resulting report is a model for what can be done with a mature program.
categories of impact are carefully defined and presented quantitatively. A survey among
grant holders produced the data reported. While the response rate was low (43 out of
200 projects), the report presents this fact honestly.

Because NRF Online will include a module for gathering progress and final reports,
information on outputs of the projects in the Focus Areas should be available relatively
conveniently in the next few years. Thuthuka and the bursary programs will need to
track their grant holders carefully, staying in touch actively and often if they want to be
able to trace career impacts. This will require a significant effort.

Although the Evaluation Centre apparently manages the logistics of the reviews, its role
seems underdeveloped in determining the knowledge/information needed to advance
given reviews. The stability of the format of reviews suggests that NRF has not kept up
with the advancing state of the art internationally in research program evaluation, an
area that has been moving forward and developing new tools particularly in Europe. It
was not clear from the documentation we received what organizational unit would be
responsible for designing and implementing a long-term performance monitoring
system.

Under recent financial accountability legislation and as required by DST, NRF has
developed a set of Key Performance Indicators, which are included in its business plan
and annual report. The NRF-level indicators have been developed in a corporate
activity, rather than in KM&S. Individual programs also reported giving attention to the
appropriate measures in their specific areas. The KPIs refer to outputs (the immediate,
tangible products of the research activity), outcomes (the expected results), and impacts
(longer-term benefits, chosen from among the goals of the National R&D Strategy).
Each of the NRF core missions and strategic priorities has a set of KPIs associated with
it.

The 2007/08 KPIs for missions are an excellent first attempt, although they do not
appear to reflect fully developed logic models for how NRF’s activities are connected
through outputs and outcomes to the designated impacts. There is a large gap between
the outcomes (many of which would be better described as output targets) and impacts.
For example, through what route does provision of research infrastructure lead to a
better rating on the U.N. Technology Achievement Index (which includes such items as
electricity consumption and telephones per capita)? It would be helpful to quantify the
size of NRF’s programs against some of the more specific desired impacts. For
example, how large would NRF’s activities need to be to increase the number of
doctrorates per million population by any significant amount? Finally, measurement
approaches for some of the KPIs are not clear (for example, knowledge dissemination
and uptake; societal benefit of research). In short, while the serious effort being put into
indicators does reflect the level of attention to performance management in the
organization, there is still room for improvement.

4.3.3 Information and strategic advice

Because the NRF plays a cross-cutting, lead role with regard to non-governmental
research in the National System of Innovation, its executive management must have
access to good information both on the NRF’s own activities, outputs and outcomes, and on the size, structure and function of the whole system. Likewise, the NRF needs information on parallel activities in other countries, and on the state of the art in research strategy and management generally.

The KM&S section on Information and Strategic Advice appears to be the central point in the organization for tapping into such information, although it is currently serving some other functions as well. This staff manages “Content Resources,” which archives data and documentation from large-scale surveys and other research projects. This function might be contracted out to a university provider to free up staff for projects that only NRF staff can undertake. This staff has also developed policies for data access, a defensive activity that while necessary detracts from the effort that goes into analysis. More strategically, the staff has analyzed the implications of higher education mergers for NRF, and is carrying out other reviews and studies to help NRF understand its strategic context.

NRF would benefit from strengthening the strategic aspects of this section’s work, and handing off administrative aspects where possible. Adequate funding for contracts to build and analyze data would multiply the section’s effectiveness, and in turn improve NRF’s and DST’s strategy formulation. There is no S&T indicators report in South Africa to give NRF a quantitative portrait of the context of its work. Instead, data collection seems rather fragmented and haphazard, and we were told that there were sometimes inadequate controls on the quality of information. A small external advisory group might be formed to provide a quality control function in this area. Clarifying the division of labor with the NACI secretariat would be needed.

### 4.3.4 Culture of learning and change

It is clear that NRF must be a learning organization, constantly adapting to a changing environment. We often heard growth and change identified as problems in getting administrative structure right at NRF, as though staff were saying, “If all this upheaval would just go away, we could really get our jobs done well.” But the organization must realize from top to bottom that change will be the way of life for NRF for a long time. Growth and transformation are the norm, not the exception.

Some aspects of organisational change need to be managed outside the KM&S Directorate, like developing simplified human resources systems and flexible budget tools. Others depend on strategic leadership from the Board and executive. The KM&S Directorate has a key role to play in providing the information for change. Performance monitoring and assessment, including periodic in-depth program evaluation, represent a key knowledge flow for strategic change. The lack of a coordinated strategy for providing that information, as well as the paucity of system-level information as a backdrop to NRF programs, is a matter of concern. Some of the analytic work that is needed is emerging now, but the Directorate also seems tasked with a number of responsibilities that distract it from its core mission. Shedding those tasks will help it function more effectively for the organization.
Recommendation (12, in priority)

Strengthen and develop the knowledge management function:

d. Develop a plan for KM&S to underpin other NRF functions.

e. Gauge the magnitude of NRF programmes against national goals.

f. Keep moving towards impact measurement.
5 SUMMING UP: THE NRF’S STRENGTHS AND WEAKNESSES, AND OVERALL PERFORMANCE

The Review Panel has had to confront a continuing paradox in its assessment of the NRF’s development since 1999.

There is no doubt that this growing organization is very well-positioned as South Africa’s premier agency specializing in grant-making for research in public institutions, which accounts for most of the publishable research done in the country. It has an increasingly diversified portfolio of funds arising from its reputation as “agency of choice” for setting up and maintaining funding programmes with particular objectives. The Foundation has also been able to take over and develop large-scale National Research Facilities to become additional instruments in the fulfilment of its core Missions while simultaneously serving as high-profile, internationalized expressions of unique South African scientific and technological opportunities.

The Annual Reports and Business Plans prepared by the NRF provide convincing evidence of visionary leadership and strategic focus; they reveal an exemplary capacity to “think things through” and to formulate a well-articulated programme of action in pursuit of the corporate Missions and goals of the organization.

Against these impressive achievements must be put our findings of internal strain at the levels of both executive and middle management, and considerable dissatisfaction and turnover in the ranks of professional and other categories of support staff. These phenomena have been fully elaborated in the RISA and SAASTA Climate and Culture Audit done in 2004. The business processes involved in grant-making have begun to suffer, and previously sound stakeholder relationships have become frayed (and not only as a result of the unfortunate decision to launch the NRF Online system before it was ready). The rapid expansion of the National Research Facilities system has undoubtedly contributed to the organisational strain and internal ferment.

The NRF also has to operate in an increasingly complex environment where, for example, the funding that it makes available (which is patently not enough) is largely deployed in a higher education system which has been the subject of intense policy-driven change over the last 5 years. This has not made things easier.

The strengths of the NRF can be attributed to its favourable statutory positioning, visionary leadership and intense demand for what it offers South African researchers, postgraduate students and institutions.

The signs of stress at the NRF are clear, due to excessively rapid diversification of its core portfolio; the absence of clearly documented agreements on policy harmonisation between the DST and the DoE; increasingly severe under-funding in relation to the needs “out there”; the growth of the National Facilities system grows; and inherent
problems in grant-making that arise from the unsustainability of relying on a limited pool of scholars contributing voluntarily to demanding peer review requirements.

Our Review seeks to affirm the NRF as playing an indispensable role in supporting research activity and capacity development at higher education institutions, to support national socio-economic development, and to help build a competitive position for South Africa in the world. The fact that we are reporting current problems in certain key areas is not a call for urgent remediation and not for destruction or de-prioritisation of the organization. Our 13 ranked recommendations are intended to allow the NRF to build on its many successes. If the NRF’s Board and executive management can consider them carefully on their merits, and work with partners and stakeholders to implement them, the NRF will perform as well over the next 5 years as it has over the last.

6. CONCLUDING REMARKS

This provisional Report is the best we can provide given the size and scope and dynamic nature of the NRF enterprise since 1999. While we believe we have attended to the requirements laid out in our Terms of Reference, we have not been able to cover all NRF activities, with the notional cut-off date of 31 March, 2004 proving to be a slightly uncomfortable boundary between a review of past performance and a view on strategic directions for the future. (Notably, we have not covered the Centres of Excellence programme, which was not included in our interview programme and on which we received no documentation.)

As an external review panel, we cannot claim to be definitive in respect of all the information we have had to rely on, or the inferences we have drawn from it.

We have enjoyed our (strenuous) interaction with over 400 members of the NRF stakeholder family, and thank them all for their time and frankness. We particularly thank Andrew Kaniki, Ayanda Noma and Arlene Maharaj for their generous assistance throughout the Review process.

The NRF is hugely important for South Africa and the African continent. Its first five years have seen growth and consolidation. It is an organization worth improving and affirming..

We hope that consideration and implementation of our recommendations will strengthen the Foundation during its second 5 years of existence as an engine of progress towards bettering the quality of life of all South Africans. We firmly believe the NRF’s success in fulfilling its Mission and meeting its goals is a critical success factor for South Africa’s prosperity in the future.
Appendix A.

TERMS OF REFERENCE

INSTITUTIONAL REVIEW OF THE NATIONAL RESEARCH FOUNDATION

1. Assignment title


2. Assignment Principal and Review Reference Group

The Assignment Principal is the President and Chief Executive Officer of the NRF. The Review Reference Group comprises the President of the NRF and four members appointed by the President of the NRF.

The role of the Review Reference Group is to:

- approve the terms of reference and to submit the final terms of reference to the Department of Science and Technology (DST);
- approve the review plan and budget from the review management service provider;
- appoint the review panel;
- receive the final report from the review panel and the responses of the management of the NRF;
- provide comments and recommendations on the review process and the extent to which the terms of reference for the review have been addressed.

The Assignment Principal will forward the following to the NRF Board and subsequently to the DST:

- the final report by the review panel;
- the response of the management of the NRF; 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.

3. Review management service provider

The Evaluation Centre of the NRF will act as the review management service provider. The responsibilities of the Evaluation Centre will be to:

- develop a plan for the review exercise, including a budget;
- manage, coordinate and administer the entire review process, including logistics;
• provide support to the review panel, including compiling reports;
• source the necessary information from the NRF before and during the review.

4. 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
  o the mandate stated in the NRF Act, as well as
  o the objectives in the strategic and business plans of the NRF;
• an assessment of the outcome and impact of the activities of the NRF;
• an assessment of the extent and effectiveness of the integration of the former CSD and the FRD;
• an assessment of the scope of the NRF mandate as stated in the NRF Act, as a result of more recent acquisitions i.e. South African Agency for Science and Technology Advancement (SAASTA) and the National Zoological Gardens, and implications for the current and future strategic objectives and activities of the NRF;
• based on the above, recommendations regarding the strategic direction and operational execution of the NRF mandate.

5. The scope of the review

The review will cover the past five financial years, i.e. since the inception of the NRF on 1 April 1999 up to 31 March 2004. In conducting the review the panel should, where possible, take into account the recommendations of previous reviews and assessments i.e.

• Review of the Agency Function
• National Research Facilities Review
• Innovation Fund Reviews
• Review of the Technology and Human Resources for Industry Programme
• Indigenous Knowledge Systems Review
• Review of the Institutional Research Development Programmes
• Review of the Science and Technology Agreements Committee funding.

6. Review dimensions

The review panel is requested to conduct an in-depth review and to determine the strengths, weaknesses and impact of the NRF i.e. both the Research and Innovation Support and Advancement (RISA) activities and the National Research Facilities, in terms of the aspects outlined below. In the case of the latter, the review panel will base its findings largely on an assessment of the reports of the in-depth reviews of the respective facilities currently underway.

6.1 Performance of the NRF

• Relate the input of the NRF to its output i.e. the extent to which the NRF is attaining its four corporate core missions. These are to develop and support:
  o high quality human resources in increasing quantities
  o the generation of high quality knowledge in prioritised areas that are responsive to national ad continental development needs
  o the utilisation of knowledge, technology transfer and innovation to ensure tangible benefits to society from knowledge created
the provision of state-of-the-art research infrastructure essential to the development of high quality human resources and knowledge;

- Assess the appropriateness of the various models of agency service provision by the NRF to various government departments i.e. Science and Technology, Trade and Industry, etc. and the value added as a result thereof;
- Comment on the synergy between the various models of agency service provision;
- Comment on the evaluation, monitoring and control of activities supported by RISA, the National Research Facilities and SAASTA;
- For benchmarking purposes, relate the performance and core competencies of the NRF, where appropriate, to similar agencies in other countries;
- Determine the extent to which the offerings and services meet the expectations of stakeholders and customers at all levels.

6.2 Strategic direction

- Comment on the relevance and impact of the NRF within the NSI in respect of its mandate, with specific reference to human resource development and research support;
- Assess the relevance of the core missions and strategic priorities and the extent to which the NRF is addressing national needs and priorities as identified in the White Paper on Science and Technology, and the National R&D Strategy and the NRF Strategic Plan;
- In the light of the above, comment on
  - the mix and focus of the different business units of the NRF in relation to its mandate
  - the appropriateness and balance of the programme mix and priority areas addressed by RISA and the National Research Facilities;
  - the disciplinary mix (Natural Sciences and Engineering, and Social Sciences and Humanities) in terms of support by programmes within the NRF; as well as
  - the utility of the NRF system of evaluating and rating of individual researchers.
- Assess the appropriateness of the strategic allocation of funds e.g. the portfolio of investment in research capacity development. Comment on the response of the NRF to the recommendations of the 1997 reviews;
- Comment on the continuous development of and learning by the NRF to address emerging needs without compromising the mandate of the NRF.

6.3 Governance and Management of the NRF

- Comment on the nature of the relationship between the NRF Board and the DST;
- Comment on the role, capabilities and efficiency of the NRF Board and its ability to respond to government priorities;
- Comment on the governance models for different kinds of programmes accommodated within RISA;
- Assess the extent to which
  - the organisational structure and
  - the existing leadership capabilities within the NRF Executive meet the current and future anticipated needs of the organisation to deliver on its mandate;
• Assess the extent to which the governance and management structures and infrastructure e.g. management information support systems, enable the strategic leadership required in the achievement of the objectives of the NRF;
• Comment on the role of advisory structures and processes in reaching sound management decisions;
• Comment on the appropriateness of the conditions for support by RISA;
• Comment on the appropriateness of the conditions of access to the National Research Facilities and SAASTA;
• Comment on the appropriateness and efficient and effective use of resources (financial and human);
• Assess the progress made with organisational transformation in terms of the integration of Natural Sciences and Engineering, and Social Sciences and Humanities within the context of the management of the NRF;
• Where possible, comment also on the appropriateness of the performance indicators (output, outcome and impact) used by the NRF;
• Comment on the extent to which an internal review culture has been institutionalised within the organisation.

6.4 Transformation

Comment on the extent to which sufficient care has been taken to address transformation. In particular, comment on:
• internal transformation of the NRF in terms of transformation policies i.e. black economic empowerment (affirmative procurement), employment equity (in particular, race and gender), staff development, access, etc;
• external transformation i.e. to what extent has the NRF contributed to transformation within the National System of Innovation, including race and gender

7. The review process

7.1 The appointment of the review panel, preparations and programme

• The assignment principal will appoint the review panel and the convenor of the review panel;
• The review panel should comprise no more than five persons with appropriate experience and skills to conduct the review and should include at least two foreign experts (Ideally, for the sake of continuity, at least one panel member involved in each of the previous reviews should be included);
• The review will comprise an assessment of evidence provided in the following resource documents which will be made available to the review panel well in advance of the commencement of the review:
  o The NRF Act
  o South Africa’s S&T Transformation Imperatives: The NSI, Policy Development and Strategic Initiatives – 1994 to 2004;
  o CSD-FRD Review (2000)
  o Self-Evaluation report by the NRF Board – Board Effectiveness
  o A comprehensive self-assessment report by the NRF (RISA)
• Reports on recent in-depth reviews of the iThemba Laboratory for Accelerator Based Sciences, South African Institute of Aquatic Biodiversity, South African Astronomical Observatory, Hermanus Magnetic Observatory, and Hartebeesthoek Radio Astronomy Observatory
• A report on the results of a corporate customer survey
• White Paper on Science and Technology
• SETI (Science, Engineering and Technology Institution) Report on the National Research Foundation and the Agency Function (completed in 1998)
• SAASTA’s SET Strategic Assessment of creating a comprehensive institutional platform for science advancement and awareness
• National Research and Development Strategy Document
• NRF Strategic and Business Plans
• NRF Annual Reports

- The Evaluation Centre will draw up a review programme in consultation with the assignment principal and NRF management. The review panel will have the opportunity to interrogate the proposed review programme and to recommend amendments and additions should the need arise;
- The review panel will have the opportunity to interview members of the NRF Board, management, stakeholders from government, industry and the Higher Education Sector (HES), recipients of research grants, student beneficiaries, users of the National Research Facilities, users of research supported by the NRF, etc;
- The review panel will decide on and pursue its own line of questioning during interviews and will likewise decide on the format of its report.

7.2 Deliverables

- A verbal feedback session on completion of the in situ reviews to the Review Reference Group, the NRF Executive and senior officials of the Department of Science and Technology;
- A preliminary report on completion of the in situ reviews;
- A final report that includes an executive summary within two weeks of completion of the in situ review. The report should, inter alia, outline the following:
  o strengths, weaknesses and impact of the NRF
  o efficient ways to reach objectives and improve on performance and impact
  o lessons for the future, strategies to be followed, etc.;
- A response from the management of the NRF within two weeks after receipt of the final report;
- 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 within two weeks after receipt of the final report;
- Placement of the final report on the NRF website within two weeks of its consideration by the NRF Board.

8. Time frame

The review will take place in February 2005 depending on the availability of the review panel members.
9. **Budget**

The Evaluation Centre will submit a budget for the review to the Review Reference Group for approval.

*The terms of reference may be amended should the need arise*

Approved by Dr K Mokhele  
Assignment Principal  

Date
Appendix B

Programme

03 – 14 February 2005

Thursday, 03 February 2005 (NRF Boardroom)

08:15 – 08:30 Welcome by Dr Khotso Mokhele, President of the National Research Foundation (NRF)

08:30 – 10:00 Briefing of the Review Panel by the Review Reference Group

Dr K Mokhele
Prof CC Mokadi, Pro Vice-Chancellor, University of Johannesburg
Dr AM Kaniki, Executive Director: Knowledge Management and Strategy
Ms GU Schirge, Manager: Evaluation Centre, NRF
Mr AV Noma, Professional Officer: Evaluation Centre, NRF

10:00 – 11:00 Discussion among the Review Panel members on review strategy

11:00 – 13:00 NRF Executive Management

Dr K Mokhele
Dr G von Gruenewaldt, NRF Vice-President and Managing Director: Research and Innovation Support and Advancement (RISA)
Dr AM Kaniki, Executive Director: Knowledge Management and Strategy
Dr E Lottering, Executive Director: Innovation Fund
Dr T Marcus, Executive Director: Research Promotion and Support (now Executive Director: Knowledge Fields Development)
Dr P Nevhutalu, Executive Director: Research Development and Support (now Executive Director: Institutional Capacity Development)
Mr P Thompson, Executive Director: Human Resources
Dr R Skeef, Executive Director: Business and Industry Partnership Programmes (now Executive Director: New Business Development)
Prof J Sharpey-Schafer, Managing Director: iThemba LABS
Dr P Charles, Managing Director: South African Astronomical Observatory (SAAO)
Ms F Osman, Business Manager: South African Astronomical Observatory (SAAO)
Dr WL Combrinck, Programme Leader: Space Geodesy Programme, Hartebeesthoek Radio Astronomy Observatory (HartRAO)
Prof P Skelton, Managing Director: South African Institute for Aquatic Biodiversity (SAIAB)
Mrs B Damonse, Executive Director: South African Agency for Science and Technology Advancement (SAASTA)
Mr W Labuschagne, Executive Director: National Zoological Gardens (NZG)
Mr J Pauw, Head: South African Environmental Observation Network (SAEON)
Ms M Pienaar, Manager: Corporate Performance Planning, Assessment and Benchmarking
Dr R Drennan, Assistant Director: Grants Management and Systems Administration

13:00 – 13:30  Lunch (The Bateleur: NRF)

Dr K Mokhele
Prof CC Mokadi
Dr G von Gruenewaldt

13:30 – 15:00  NRF Board

Prof C Hamilton, Director: Graduate School for Humanities and Social Sciences, University of the Witwatersrand
Prof CC Mokadi, Pro Vice-Chancellor: University of Johannesburg
Prof P Ngoepe, Director: Materials Modelling Centre, University of the North

15:00 – 17:00  Department of Science and Technology (DST)

Dr R Adam, Director-General
Mr P Pedlar, Group Executive: Government, Science and Technology Systems
Ms A Canca, Acting Group Executive: Science and Technology for Competitiveness

17:00 – 18:00  Review Panel Discussions

18:00  Welcome cocktails (NRF Reception Foyer)

Dr K Mokhele, NRF President
Prof C Hamilton
Prof P Ngoepe
Dr G von Gruenewaldt
Dr AM Kaniki
Dr E Lottering
Dr P Nevhutalu
Dr T Marcus
Mr P Thompson
Dr R Drennan

Friday, 04 February 2005 (NRF Boardroom)

08:00 – 09:00  Review Panel discussions

09:00 – 10:30  Department of Agriculture (DOA)
Mr RJ Sebola, Manager: Scientific Research and Development

10:30 – 12:00 Departments of Trade and Industry (DTI) and Labour (DOL)

DTI
Dr JFA Potgieter, Chief Director: Innovation and Technology

DOL
Mr S Nakanyane, Executive Manager: Research, Policy and Planning

12:00 – 13:00 Departments of Arts and Culture (DAC)
Prof I Mosala, Director-General

13:00 – 14:00 Lunch with representatives of Mintek (The Bateleur: NRF)

Dr P Jourdan, Chief Executive Officer
Dr F Petersen, General Manager: Research and Development

14:00 – 15:30  Department of Education (DOE)
Dr M Qhobela, Chief Director: Policy Development and Support
Dr S Boshoff, Director: Planning, Management and Support

15:30 – 17:00 Executive Management of NRF’s Research Innovation Support and Advancement (RISA)
Dr G von Gruenewaldt, Managing Director: Research and Innovation Support and Advancement  
Dr TS Marcus, Executive Director: Research Promotion and Support (now Executive Director: Knowledge Fields Development)  
Dr PA Nevhutalu, Executive Director: Research Development and Support (now Executive Director: Institutional Capacity Development)  
Dr E Lottering, Executive Director: Innovation Fund  
Dr AM Kaniki, Executive Director: Knowledge Management and Strategy  
Mr P Thompson, Executive Director: Human Resources  
Dr R Drennan, Assistant Director: Grants Management and Systems Administration  
Mrs B Damonse, Executive Director: SAASTA

17:00 – 18:00  
**NRF’s Corporate Finance and Human Resources**

Mr P Thompson, Executive Director: Human Resources  
Mr B Singh, Manager: Finance  
Mrs A Nieuwoudt, Group Accountant  
Mrs M Mofokeng, Manager: Human Resources  
Mr L Tambani, Senior HR Officer  
Mr E Mnisi, Manager: Employee and Labour Relations, NZG

19:00  
**Dinner with Minister of Science and Technology, Mr M Mangena**

Venue: Cynthia’ Restaurant and Art Gallery  
Maroelana Centre  
Maroelana  
Tel: 012 460 3220/9  
Website: [www.cynthias.co.za](http://www.cynthias.co.za)

**Saturday, 05 February 2005 (NRF Boardroom)**

08:00 – 10:00  
**Discussions with Dr Marcus, Dr Nevhutalu and Dr Drennan**

10:00 – 10:15  
**Tea/Coffee**

10:15 – 11:15  
**Research Development and Support Directorate**

Dr P Nevhutalu, Executive Director (now Executive Director: Institutional Capacity Development)  
Dr S Koyana, Manager: Thuthuka Programme  
Mr K Molefe, Professional Officer: Thuthuka Programme
Mr S Leballo, Acting Manager: Institutional Research Development Programme (now Acting Manager: Research Capacity Development Programmes, GMSA)
Ms N Maistry, Professional Officer: Institutional Research Development Programme
Ms S van Niekerk, Professional Officer (PO): Institutional Research Development Programme
Mr R Kriger, Manager: International Science Liaison (now Manager: Special Projects)
Ms E Ndhundhuma, PO: International Science Liaison (now PO: International Science Liaison, GMSA)
Mr H Michau, Manager: Student Support (now Manager: Student Support, GMSA)
Ms Y Davis, PO: Student Support (now PO: Student Support, GMSA)
Mr G Moolman, Manager: Central Grants Administration (now Manager, CGA, GMSA)

11:15 – 12:15 Research Promotion and Support Directorate

Dr T Marcus, Executive Director (now Executive Director: Knowledge Fields Development)
Ms C Levieux, Manager: FAPs – Distinct South African Opportunities and Unlocking the Future and SANAP
Mr L Monyooe, Manager: FAPs - Economic Growth and International Competitiveness, Information and Communication Technology, Socio-Economic Impact of Globalization, and Sustainable Livelihoods
Dr R Drennan, Manager: Centres of Excellence (now Assistant Director: Grants Management & Systems Administration)

12:15 – 13:15 Business and Industry Partnership Programmes

Dr R Skeef, Executive Director (now Executive Director: New Business Development)
Prof HE Hanrahan, member of the THRIP Board

13:15 – 14:00 Lunch (The Bateleur)

14:00 – 15:00 Innovation Fund (IF)

Dr E Lottering, Executive Director
Mr M Sibanda, Senior Patent Attorney

15:00 – 16:30 Knowledge Management and Strategy Directorate
Dr AM Kaniki, Executive Director
Dr E Maepa, Manager: Information and Strategy Advice Unit
Mr P Moraka, Manager: Information Technology
Mr R Kriger, Manager: Special Projects
Ms R Mabaso, Principal Specialist: Communities of Practice
Ms N Kwatsha, Principal Information Specialist: Records and Documents Management
Ms GU Schirge, Manager: Evaluation Centre
Ms A Raedel, Professional Officer: Evaluation Centre
Mr AV Noma, Professional Officer: Evaluation Centre

16:30 – 17:30  Review Panel discussions

Sunday, 06 February 2005 (NRF Boardroom)

09:30 – 11:00  Presentation and discussion on the NRF Stakeholders Survey

Service Provider: Marketing Surveys & Statistical Analysis (MSSA)
  Mr S van Vuuren
  Mr H Moloantoa

11:00 – 12:00  RISA Staff (Professional Officers, Liaison Officers and Others)

  Mr E Moeng
  Ms J Warffemius
  Ms H Marx
  Mr B Ntambeleni
  Ms M Bunker-Blume
  Ms E Heathfield
  Mr J Khanyile
  Mr S Leballo
  Ms L Erasmus
  Ms S Mthembu
  Ms R de Bruyn
  Ms R Bhinson

12:00 – 13:00  RISA Staff (Managers)

  Mr H Michau
  Mr R Kriger
  Mr G Moolman
  Mr M Muofhe
Ms GU Schirge  
Mr V Phehane  
Mr C Fambisayi  
Mr B Singh

13:00 – 14:00  Lunch (The Bateleur)
14:00 – 15:00  Review Panel discussions
15:00  Programme for the rest of the afternoon to be decided by the Review Panel

Monday, 07 February 2005 (NRF Boardroom)

08:00 – 09:00  The Presidency

Mr A Hirsch, Chief Director: Economic Sector

09:00 – 10:30  Heads of other Science Councils

Dr G Graham, Executive Manager: Scientific Support Services, Council for Geosciences  
Dr S Sibisi, President: Council for Scientific and Industrial Research (CSIR)  
Dr N Tau-Mzamane, President: Agricultural Research Council (ARC)  
Dr R Maharaj, Executive Director: Office of the Chief Executive, Human Sciences Research Council (HSRC)  
Prof A Mbewu, President: Medical Research Council (MRC)  
Dr R Kfir, Chief Executive Officer: Water Research Council (WRC)  
Mr M Kuscus, Chief Executive Officer: South African Bureau of Standards (SABS)

10:30 – 10:45  Tea/Coffee

10:45 – 11:45  National Advisory Council on Innovation (NACI)

Prof C Pistorius, Chairperson  
Dr HC Marais, Head: Secretariat

11:45 – 13:00  Higher Education Quality Committee (HEQC) and Council on Higher Education (CHE)

Dr M Singh, Executive Director: HEQC
Prof S Badat, Chief Executive Officer: CHE

13:00 – 14:00  Lunch (The Bateleur)

14:00 – 15:30  South African University Vice-Chancellors Association (SAUVCA)

Ms T Yeowart, Director: Administrative Services
Prof N Ndebele, SAUVCA Chairperson and Vice-Chancellor, University of Cape Town
Prof N Baijnath, Vice Principal: Research and Planning, University of South Africa
Prof L Nongxa, Vice-Chancellor, University of the Witwatersrand
Dr T Eloff, Vice-Chancellor, North-West University

15:30 – 17:00  Committee of Technikon Principals (CTP)

Dr DJJ Van Rensburg, Executive Director: CTP
Prof AT Mokadi, Chairperson CTP and Vice Chancellor: Vaal University of Technology (VUT)
Prof R Ngcobo, Vice Chair CTP and interim Vice Chancellor: Tshwane University of Technology (TUT)
Prof LR Brunyee, Vice Chancellor: Border Technikon
Dr MM Balintulo, interim Vice Chancellor: Cape Peninsula University of Technology (CPUT)

17:00 – 18:00  Review Panel discussions

Tuesday, 08 February 2005 (NRF Boardroom)

08:00 – 09:00  Review Panel discussions

09:00 – 10:45  Directors or Deans of Research of Higher Education Institutions

Dr M Sienaert, University of Cape Town (UCT)
Prof P Engelbrecht, University of Stellenbosch
Prof R Bharuthram, University of KwaZulu-Natal (UKZN)
Prof A Gilbert, University of Fort Hare (UFH)
Prof DCJ Wessels, University of the North (UNORTH)
Prof BL Robertson, University of Port Elizabeth (UPE)
Mr I Burns, University of the Witwatersrand (WITS)
Prof D Pillay, Durban Institute of Technology (DIT)
10:45 – 11:00 Tea/Coffee

Parallel Sessions

<table>
<thead>
<tr>
<th>11:00 - 13:00</th>
<th>Business, Industry and Non-Governmental Organisations</th>
<th>12:00 – 13:00</th>
<th>NRF International Relations (NRF Staff)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venue:</td>
<td>Board Room</td>
<td>Venue:</td>
<td>Atrium A</td>
</tr>
<tr>
<td></td>
<td>Dr JM Stewart</td>
<td></td>
<td>Dr P Nevhutalu</td>
</tr>
<tr>
<td></td>
<td>Mr GM Tosen, ESKOM</td>
<td></td>
<td>Mr R Krige</td>
</tr>
<tr>
<td></td>
<td>Dr J Gosling, ESKOM</td>
<td></td>
<td>Ms E Ndhoundhuma</td>
</tr>
<tr>
<td></td>
<td>Dr C Albrecht, Cancer Association of South Africa</td>
<td></td>
<td>Ms N Mughivi</td>
</tr>
<tr>
<td></td>
<td>Mrs P Drodskie, South African Chamber of Business</td>
<td></td>
<td>Ms M Pillay</td>
</tr>
<tr>
<td></td>
<td>Mr G Davies, Development Bank of Southern Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr J Ludik, Crusader Systems</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13:00 – 14:00 Lunch (The Bateleur)

Parallel Sessions

<table>
<thead>
<tr>
<th>14:00 – 16:00</th>
<th>NRF Grantholders</th>
<th>15:30 – 16:30</th>
<th>NRF Rating System for individual researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venue:</td>
<td>Board Room</td>
<td>Venue:</td>
<td>Bateleur</td>
</tr>
<tr>
<td></td>
<td>Dr JM Mphahlele, Medical University of South Africa (MEDUNSA)</td>
<td></td>
<td>Dr G von Gruenewaldt</td>
</tr>
<tr>
<td></td>
<td>Prof PA Mbati, University of the North</td>
<td></td>
<td>Ms GU Schirge</td>
</tr>
<tr>
<td></td>
<td>Prof P Denis, University of KwaZulu-Natal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof E Webster, University of the Witwatersrand</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof T Nyokong, Rhodes University</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof C Winburg, Peninsula Technikon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof J Conolly, Durban Institute of Technology</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr GK Setswe, University of the Witwatersrand</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof S Nicolson, University of Pretoria</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof R von Solms, Port Elizabeth Technikon</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof CL Obi, University of Venda</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6:00 – 18:00</td>
<td>Discussions on NRF's International Relations</td>
<td>16:00 – 17:00</td>
<td>Department of Education</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------------------------------</td>
<td>---------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Venue: NRF Board Room</td>
<td>Venue: Atrium A</td>
<td>Ms N Badsha, Deputy Director-General, Higher Education</td>
<td></td>
</tr>
</tbody>
</table>

Mr D du Buisson, Department of Foreign Affairs
Mr H Staschenuk, Embassy of the Federal Republic of Germany
Mrs IK Stoll, Embassy of the Kingdom of Norway

18:00 – 18:30 Review discussions

Wednesday, 09 February 2005

Tshwane University of Technology, Building 20, Room 111

07:50 Arrival at Tshwane University of Technology (Tea/coffee)

08:00 – 09:30 Executive Management of the Tshwane University of Technology

Prof R Ngcobo, Vice-Chancellor and Principal
Prof G Lenyai, Senior Deputy Vice-Chancellor: Academic
Prof J Molefe, Senior Deputy Vice-Chancellor: Development
Prof H Dürreheim, Deputy Vice-Chancellor: Academic – Science, Education and Technology
Prof M Sibara, Deputy Vice-Chancellor: Academic – Management Sciences
Prof L van Staden, Deputy Vice-Chancellor: Academic – Social & Information Sciences
Prof S Imenda, Dean: Faculty of Education
Prof A Lourens, Director: Research & Development
Prof M Lowes, Dean: Faculty of Health Sciences
Prof P Marais, Dean: Faculty of Natural Sciences
Prof G Mills, Dean: Faculty of Arts
Prof F Otieno, Dean: Faculty of Engineering
Ms M Reynders, Dean: Faculty of Tourism, Hospitality & Leisure
Prof M Scerri, Dean: Faculty of Economic Sciences
Prof I Selala, Dean: Faculty of Agricultural Sciences
Prof M van der Merwe, Dean: Faculty of Management Sciences
Prof P van Eldik, Advisor to the Vice-Chancellor
Mr A van Staden, Dean: Faculty of Social Development Studies
09:30 – 11:00  

**Members of staff/Researchers**

(Tea/coffee will be served)

- Prof E Albertse
- Prof P Conradie
- Mr G du Toit
- Ms G Enslin
- Mr A Hattingh
- Prof D Katskov
- Mr S Letsoalo
- Ms M Madiba
- Prof R McCrindle
- Dr C Nkambule
- Mr E Sibanda
- Prof G Steyn
- Prof O Vorster
- Prof J Youngleson
- Prof L Anelich
- Prof O Dintchev
- Dr K Dyason
- Ms A Greeff
- Prof S Joubert
- Prof A Lourens
- Prof M Mbarawa
- Prof P Ngobeni
- Dr R Raseleka
- Prof L Smith
- Prof W van Averbeke
- Ms D Wright

11:00 – 12:00  

**Drive to University of Johannesburg**

**University of Johannesburg, A ring 3, Council Chambers**

12:00 – 13:30  

**Lunch with Executive Management of the University of Johannesburg**

- Prof R Botha, Vice-Chancellor
- Prof CC Mokadi, Pro Vice-Chancellor
- Prof D van der Merwe, Deputy Vice-Chancellor: Academic Administration and Research
- Prof E Tyobeka, Deputy Vice-Chancellor: Academic Administration and External Relations
- Prof A Redlinghuis, Deputy Vice-Chancellor: Strategic and Institutional Planning and Implementation
- Dr MEC Moleki, Registrar: Operations
- Prof M Muller, Dean: Education
- Prof L Pretorius, Dean: Engineering and the Built Environment
- Prof H Kriek, Dean: Economic and Financial Sciences
- Prof T auf der Heyde, Dean: Research
- Prof K Burger, Dean: Science
- Prof J Otto, Dean: Law

13:30 – 15:00  

**Members of staff/Researchers**
Prof H Kriek, Dean: Faculty of Economic and Financial Sciences
Prof M Muller, Dean: Faculty of Education
Dr P Tilney
Prof G Roodt
Prof L Pretorius
Prof G Kruger
Ms H Oosthuizen
Dr A Dockrat
Prof V Goranko
Ms N Petersen
Prof H Ferreira
Prof D van Reenen
Prof V Wepener
Ms H du Plessis
Mr S Durbach
Dr S de Kock
Prof Antoine
Prof B-E van Wyk
Dr A Mateete
Mulaba-Bafubiandi

15:00 – 16:00 Postgraduate students
Selection of postgraduate students

16:00 Review Panel departs for Johannesburg International Airport
Flight Details SA 363 Y JNB - CPT HS1 18:10 20:20

Thursday, 10 February 2005 (Cape Town)

University of the Western Cape, Room Ic, School of Governance Building

08:30 – 09:00 Meeting with the Vice-Chancellor of the University of the Western Cape
Prof B O’Connell

09:00 – 10:00 Meeting with Deans of faculties
Prof R Christie, Dean: Research Development (Host)
Prof A Krog, Poet and Prof of Afrikaans
Prof S Ridge, Dean: Faculty of Arts
Prof Tapscott, Dean: Economic and Management Sciences
Prof H Moola, Dean: Dentistry
Prof J van Bewerdonker, Dean: Science
Prof R Mpofu, Dean: Community and Health Sciences
Prof D Meerkotter, Dean: Education
Prof N Moosa, Dean: Law

10:00 – 12:00

Members of staff/Researchers

12:00 – 13:00

Postgraduate students

13:00 – 14:00

Lunch

14:00 – 14:30

Travel to iThemba LABS

iThemba LABS

14:30 – 16:00

iThemba Laboratories for Accelerator Based Sciences

Executive Management of iThemba LABS

16:00

Depart for the Cape Town International Airport

Flight Details

SA 362 Y CPT - JNB HS1 17:40 19:40

Friday, 11 February 2005 (NRF Boardroom)

08:00 – 09:00

South African Agency for Science and Technology Advancement (SAASTA)

Mrs B Damonse, Executive Director: SAASTA

09:00 – 10:00

Museums

Mr L Maphasa, Natal Museum
Dr FC de Moor, Albany Museum
Mr J Brink, National Museum
Mr M Makgolo, Northern Flagship Institution (NFI)
Dr F Thackeray, Transvaal Museum, Northern Flagship Institution
Dr H Robertson, Director: Natural History Collections, Iziko Museums

10:00 – 11:00

South African Research and Innovation Management Association (SARIMA)
11:00 – 12:00 National Science and Technology Forum (NSTF), Academy of Science of South Africa (ASSAf) and the South African Academy of Engineering (SAAE)

Dr J Hlongwane, Chief Executive Officer: NSTF
Prof J Jansen, Vice President: ASSAf
Dr P Mjwara, General Secretary: ASSAf
Prof JAG Malherbe, Executive Committee Member: SAAE

12:00 – 13:00 South African Institute for Aquatic Biodiversity (SAIAB), National Zoological Gardens (NZG) and the South African Environmental Observation Network (SAEON)

Prof P Skelton, Managing Director: SAIAB
Mr W Labuschagne, Executive Director: NZG
Mr Johan Pauw, Head: SAEON

13:00 – 13:30 Lunch (Boardroom Foyer)

13:30 – 15:00 Astro-geosciences Facilities

Prof J Jonas, Managing Director: Hartebeesthoek Radio Astronomy Observatory (HartRAO)
Prof P Charles, Managing Director: South African Astronomical Observatory (SAAO)
Prof P Martinez, Previous Acting Managing Director: South African Astronomical Observatory (SAAO)
Dr P Sutcliffe, Managing Director: Hermanus Magnetic Observatory (HMO)

15:00 – 16:00 Discussion with Dr K Mokhele

16:00 – 17:00 Telephone conference with Chairperson of the NRF Board (Venue: A119)

Prof BD Reddy

17:00 – 18:30 Review Panel discussions

Saturday, 12 February 2005 (NRF Boardroom)
10:00 – 11:00  Local members from the review panels of iThemba LABS, SAIAB and Astro-geosciences facilities

Prof MJ Gibbons, SAIAB
Prof JD Comins, iThemba LABS
Dr V Munsami, Astro-geosciences Facilities

11:00 – 12:00  Advisory Committee members and Panel members (Granting programmes)

Prof RM Setati, University of the Witwatersrand
Prof KG Tomaselli, University of KwaZulu-Natal
Prof DP Visser, University of Cape Town
Prof MJ Mphahlele, University of South Africa
Prof ER Kalula, University of Cape Town
Prof BW Skews, University of the Witwatersrand

12:00 – 13:30  Assessment Panel/Specialist Committee Members (NRF Rating System)

Dr C O’Ryan, University of Cape Town
Prof DD van Reenen, University of Johannesburg
Prof JW Fedderke, University of Cape Town
Prof RE Kirsch, University of Cape Town
Prof B Pillay, University of KwaZulu-Natal
Prof T McLellan, University of the Witwatersrand
Prof H Huismans, University of Pretoria
Prof JR Midgley, Rhodes University
Prof E Webster, University of the Witwatersrand
Prof DP Visser, University of Cape Town
Prof KG Tomaselli, University of KwaZulu-Natal
Prof ER Kalula, University of Cape Town
Prof BW Skews, University of the Witwatersrand

13:30 – 18:00  Review Panel discussions and report writing

Sunday, 13 February 2005

08:00 – 13:00  Review Panel discussions and report writing

13:00 – 14:00  Lunch

14:00 - 17:00  Review Panel discussions and report writing
Monday, 14 February 2005 (NRF Boardroom)

08:00 – 13:00 Review Panel discussions and report writing

13:00 – 14:00 Lunch (Bataleur)

Dr K Mokhele
Prof CC Mokadi
Prof C Hamilton

14:00 - 16:00 Report back session and handing over of draft report (NRF Auditorium)

Review Reference Group
Dr K Mokhele
Prof CC Mokadi (also NRF Board)
Prof BD Reddy (also NRF Board)
Prof L Richter

NRF Board
Prof C Hamilton
Mr M Nxumalo

NRF Executive
Dr G von Gruenewaldt, NRF Vice-President
Dr A Kaniki, Executive Director: Knowledge Management and Strategy
Dr E Lottering, Executive Director: Innovation Fund
Dr T Marcus, Executive Director: Knowledge Fields Development (previously Executive Director: Research Promotion and Support)
Dr P Nevhutalu, Executive Director: Institutional Capacity Development (previously Executive Director: Research Development and Support)
Mr P Thompson, Executive Director: Human Resources
Prof J Sharpey-Schafer, Managing Director: iThemba LABS
Dr P Charles, Managing Director: South African Astronomical Observatory (SAAO)
Prof J Jonas, Managing Director: Hartebeesthoek Radio Astronomy Observatory (HartRAO)
Dr P Sutcliffe, Manager: Hermanus Magnetic Observatory (HMO)
Mrs B Damonse, Executive Director: South African Agency for Science and Technology Advancement (SAASTA)
Mr W Labuschagne, Executive Director: National Zoological Gardens (NZG)
Mr J Pauw, South African Environmental Observation Network

**Department of Science and Technology**
Dr A Paterson, Group Executive: Science and Technology for competitiveness
Mr P Pedlar, Group Executive: Government, Science and Technology System
Prof A Nesamvuni, Manager: Human Capital

**16:00 – 17:00**  
Debriefing session

Review Reference Group

**17:00**  
Review Panel adjourns
List of Resource Documents for the NRF Review

Environmental Context
a. NRF Act (1998)
b. South Africa’s Science and Technology Transformation Imperatives: The National System of Innovation, Policy Development and Strategic Initiatives – 1994 to 2004 (Synthesis of documents 3 to 7)
c. SETIs (Science, Engineering and Technology Institutions) Report on the System Wide Review
d. SETIs Report on National Facilities (completed in 1998)
e. SETIs Report on the National Research Foundation and the Agency Function (completed in 1998)
f. South Africa’s National Research and Development Strategy (August 2002)
g. White Paper on Science and Technology (September 1996)
h. CSD-FRD Review (2000)
i. A National Key Research and Technology Infrastructure Strategy (July 2004)
k. Terms of Reference for the NRF Review

National Research Foundation (NRF)
l. NRF Corporate Overview
m. NRF Business Plan 2004 - 2007
n. NRF Annual Report 2003 – 2004
t. Review Report of the NRF Programmes directed at Research and Research Capacity Development at Historical Black Universities (August/September 2001)
u. Review Report of the NRF Programmes directed at Research and Research Capacity Development at Technikons (July/August 2001)
w. RISA and SAASTA Climate and Culture Audit Report (July 2004)

Reviews of the National Research Facilities
z. Review Report of the iThemba Laboratory for Accelerator Based Sciences (November 2004)

aa. Management Response to the Review Report of iThemba Laboratory for Accelerator Based Sciences


dd. SAASTA’s SET Strategic Assessment of creating a comprehensive institutional platform for science advancement and awareness Report (August 2004)

ee. SAASTA’s New Strategic Approach Report to the NRF Board

ff. Report on the Repositioning of the National Zoological Gardens as a National Research Facility within the NRF (November 2004)

ABBREVIATIONS AND ACRONYMS

ACEP African Coelacanth Ecosystem Programme
ASSAf Academy of Science of South Africa
CHE Council on Higher Education
CoEs Centres of Excellence
CSD Centre for Science Development
CSIR Council for Scientific and Industrial Research
DAC Department of Arts and Culture
DEAT Department of Environmental Affairs and Tourism
DoA Department of Agriculture
DoE Department of Education
DoH Department of Health
DoL Department of Labour
DST Department of Science and Technology
FAP Focus area programmes
FRD Foundation for Research Development
GCR Global Change Research
HartRAO Hartebeesthoek Radio Astronomy Observatory
HBUs Historically Black Universities
HDI Historically disadvantaged institution
HEI Higher education institution
HEQC Higher Education Quality Committee
HESA Higher Education South Africa
HMO Hermanus Magnetic Observatory
HR Human resources
HSRC Human Sciences Research Council
HWUs Historically White Universities
ICDP Institutional Capacity Development Programme
ICSU International Council for Science
ICT Information and communication technology
IF Innovation Fund
IKS Indigenous knowledge systems
IPR Intellectual property rights
IRDP Institutional Research Development Programme
ISL International Science Liaison
IT Information Technology
iThemba LABS iThemba Laboratory for Accelerator Based Sciences
KMS Knowledge management system
KPI Key Performance Indicator
MRC Medical Research Council
MRMC Major Radiation Medicine Centre
NACI National Advisory Council on Innovation
NEPAD New Partnership for Africa’s Development
NGO Non-governmental organisation
NRF National Research Foundation
NSE Natural Science and Engineering
NSF National Science Foundation
NSI National System of Innovation
NSTF National Science and Technology
NZG National Zoological Gardens
PFMA Public Finance Management Act
PhD Doctor of Philosophy
PMS Performance Management System
PQM Programme and Qualifications Mixes
PUSET Public Understanding of Science, Engineering and Technology
R&D Research and Development
RCD Research capacity development
RDP Research Development Programme
S&T Science and Technology
SAAE South African Academy of Engineering
SAAO South African Astronomical Observatory
SAASTA South African Agency for Science and Technology Advancement
SABI South African Biosystematics Initiative
SABIF South African Biodiversity Information Facility
SABS South African Bureau of Standards
SADC Southern African Development Community
SAEON South African Environmental Observation Network
SAIAB South African Institute for Aquatic Biodiversity
SALT Southern African Large Telescope
SARIMA South African Research and Innovation Management Association
SET Science, Engineering and Technology
SSH Social Sciences and Humanities
STAC Science and Technology Agreements Committee
The dti Department of Trade and Industry
THRIP Technology and Human Resources for Industry Programme
UWC University of the Western Cape
WRC Water Research Commission