REVIEW OF THE DST/NRF CENTRE OF EXCELLENCE (CoE) PROGRAMME

The Review Panel consisting of Dr Susan E Cozzens, Associate Dean for Research, Ivan Allen College of Humanities and Social Sciences, Georgia Institute of Technology, Atlanta, Georgia, USA and Dr David R Woods (Convener) met at the NRF from 23 – 26 June, 2009. The Panel met with various members of the DST, NRF, ARC and the Directors of the CoEs (Appendix 1 – Programme for the Review of the CoE Programme).

EXECUTIVE SUMMARY

The Review Panel was requested to assess the conception, implementation and management of the DST/NRF CoE from inception to 30 June 2008 and to make recommendations for the future to enhance the DST/NRF CoE Programme.

The conception of the DST/NRF CoE Programme was based on overseas experience and the need to enhance major collaborative research and the training of research students in SA. The CoE Programme was well thought through and implemented through an open call for proposals and selection process which was perceived as thorough and fair. The bottom-up process was important and a model that should be followed in the future. Implementation via a “stage gate” model and different Service Level Agreements worked and all seven CoEs were successfully established.

Each CoE was required to address six key performance areas: research, education and training, information brokerage, networking, service rendering, and management which have formed a useful framework for centre reporting and for the five year assessment. The CoEs were required to produce annual reports, “nuggets” (articles for the general public) and monthly cash flow reports. It appears that the “nuggets” were not regularly published by the NRF and one CoE reported that the most recent “nugget” on the NRF website was from 2007. Although the monthly cash flow reports were important initially, consideration should be given to replacing them with quarterly cash flow reports. Management of the CoEs has benefited from the appointment of first rate managers, some with PhDs.

The Boards have been important in the management, strategic direction and interaction with the host university of the CoE. The NRF should consider their representation on the Boards and ensure a greater consistency of representation. There is much value in having a stable CoE programme officer within the NRF.

All the CoEs were extensively reviewed by international experts. The CoEs were praised for having performed exceptionally well and are internationally competitive. All the CoEs have met all the aims of the programme. Not only has the output of publications in peer reviewed journals improved but there has been a significant improvement in the impact factors.

The problems of attracting SA black students into research are well known and the CoEs have been proactive in the recruitment of black students. This has involved mentorship programmes at undergraduate level, development of school programmes
and nodes on predominantly black campuses. Nevertheless the majority of black students have been recruited from other African countries.

The creation of the Research Chairs has caused problems for some Directors of CoEs as they are perceived to be more prestigious, have a 15 year life span and the money is better. Both initiatives are essential for SA and the DST/NRF need to manage the perceptions of researchers and institutions so that both initiatives flourish.

The Review Panel accepts the fixed 10 year term for CoEs. However, we are concerned that what has been developed at each CoE could disintegrate. The DST/NRF, Boards and CoEs must start immediately to plan for year10.

RECOMMENDATIONS:

1) The DST/NRF should continue funding each of the CoEs for a further 5 years.

2) The DST/NRF should continue the CoE Programme and run another bottom-up competition as soon as possible.

3) The DST/NRF should encourage other Government Departments and Research Councils to provide funding for CoEs in specific areas. The process should be managed by the NRF and the specialised CoEs awarded on an open and competitive basis.

4) The DST/NRF should develop strategies to prevent the loss of critical mass and expertise that has been developed, e.g., eligibility for Research Chairs and support for research students.

5) The DST/NRF, Boards and CoEs should start immediately to plan for the year 10 transition.

TERMS OF REFERENCE

The letter of appointment of the Panel indicated that the purpose of the review will be twofold, i.e. firstly, to assess

- the conception, implementation and management of the DST/NRF CoE Programme from inception to 30 June 2008

and, secondly, to make recommendations for the future to enhance

- the DST/NRF CoE Programme.

The Terms of Reference for the Review of the DST/NRF CoE Programme is attached as Appendix 2.
BACKGROUND DOCUMENTS FOR THE REVIEW OF THE DST/NRF CoE PROGRAMME

The Panel was supplied with a comprehensive set of documents relating to the CoE Programme including the seven self review reports and the seven external review reports on the individual CoEs (Appendix 2 p. 7-9).

THE REVIEW PROCESS

The panel review compliments the DST/NRF on arranging a very thorough review process of each of the centres and the programme in general. Utilizing international expertise will certainly assist the further development of each centre and the programme itself.

CONCEPTION

Centres of Excellence have become a common research funding instrument, appearing in many countries. Those who planned South Africa’s programme report having consulted relevant experience in Australia, Canada, and the United States, and centre reviewers noted parallels with the United Kingdom as well. Some of the elements built into the South African programme are common to CoE programmes elsewhere. For example,

- The Centres are designed to supplement, not supplant, other funding mechanisms.
- The Centres support research that requires large scale, long duration, special equipment, or interdisciplinary teams.
- The large size of a centre grant lets a research programme achieve a critical mass of senior researchers.
- Centres are expected to achieve several goals in an integrated fashion, including education, outreach, and high levels of stakeholder interaction, along with research.
- Centres stimulate change in research culture by creating models for new ways of operating.

Some of the elements of the DST/NRF CoE programme, however, have particular relevance in South Africa today. For example, quoting from the programme’s documents:

- “Exploiting the competitive advantage vested in outstanding researchers” and “rewarding, retaining, sustaining and improving scientific excellence” are particularly important in a research system in transition from an old to a new state.
- “Providing secure and stable funds for research and knowledge dissemination” is particularly important at a time when institutions are under stress.
- “Reducing micro-management of academics and their resources by the funding agency” provides well-deserved autonomy for leading researchers in the system.
The multiple, interacting goals of centres have also made them powerful contributors to capacity development, both by training people and establishing institutional links, both pressing needs in the South African context.

In short, international experience has shown that a strong research system includes centres of excellence in order to provide support for collaboration, critical mass, diversity of intellectual opportunity, and scale of research. South Africa’s research system is particularly in need of those qualities at the present time. We applaud DST and NRF for establishing the programme and designing it in a way that has stood the test of time.

IMPLEMENTATION

The programme was initially implemented through an open call for proposals and selection process in 2003, followed by start up of the first centres in June, 2004. The selection process was perceived as thorough and fair, with care taken to choose centres from several topical areas. Several of those we interviewed noted that the bottom-up proposal process contributed importantly to the success of the programme. We agree. The open call gave full opportunity to the best minds in South Africa to put forward a wide range of good ideas. This process was well suited to the purpose of strengthening the research system through competition among talented research leaders.

The centres were put in place using a “stage gate” model, with a different Service Level Agreement for each stage. The centre directors report that they were at first sceptical about this process, but found that it worked out well. NRF managers likewise report that while some of the centres had rocky beginnings, they were able to work through these using the stage gate structure.

In the end, one key indicator shows that implementation of the programme was successful. All seven centres were successfully established and swung into operation in a reasonable period of time. Since this has not always been accomplished with every centre internationally, the South African programme can be proud of having passed this stage gate of its own.

The differences in funding levels have caused discontent and should be explained at the outset.

MANAGEMENT WITHIN CENTRES

Key Performance Areas and Targets

The design of the CoE programme called for each centre to address six key performance areas: research, education and training, information brokerage, networking, service rendering, and management. Expectations in each area shifted upwards according to the Center’s stage in the stage-gate model. The six KPAs have formed a useful framework for centre reporting and for the five-year assessments just

1 Other CoEs have been funded through a different process referred to as “top-down” in programme documents. We return to discussion of this process later in the report.
completed. Centre-specific targets have been set in each area on key performance indicators.

The Centres received these performance areas positively, and reported that they influenced their actions. The requirement to raise the impact of international publications, for example, has led clearly to a different portfolio of publications, and through these to a stronger link to the highest international quality standards in each field. Likewise, the requirements for information brokerage, networking, and service rendering have stimulated new connections for centre researchers.

One centre review panel, however, felt that the performance indicators chosen kept the centre from exploring new, risky research areas, by setting up “short-term imperatives that favour existing highly-cited fields and individuals.” (Bird review, p. 2) The same panel felt there was a tension between short term publication goals and building the right stakeholder networks for the centre’s core work (Birds . 13) Another panel worried about service provision taking too much time (CIB review p. 10). And a centre director noted that the publication quality goal is in tension with the emphasis on quantity of publication in the budgeting numbers game for universities.

Planning, Tracking, and Reporting

Management of the centre itself is one of the six key performance areas for centre leadership. Centre management consists not only of the normal administrative tasks associated with hiring research staff and students and keeping accounts straight, but also in the case of the CoEs a significant level of planning, tracking and reporting. To help in this task, each centre was required by the programme to hire a Research Manager using centre funds.

Centre directors felt that their annual performance reports, in the six performance areas, were a reasonable expectation and an opportunity for them to gather the basic data on centre operations that they needed for a variety of purposes. These annual reports made it easy for centres to produce the self-assessments required for this review process, and also allow NRF to convey the achievements of programme as a whole. Centres were also asked to produce “nuggets” – short stories that illustrated their work vividly. They were not always sure what happened with these nuggets, but did not mind producing them. Auditing requirements were seen as necessary, but expensive.

The panels reviewing the centres did not always agree with this assessment. The TB panel, for example, wrote (p. 3 of their executive summary), “… the requirement for separate annual reports and business plans, monthly budgetary/fiscal reports, periodic self-assessment and strategic plans burden CoE staff and principals unnecessarily and take resources and time away from research and training.” The CIB review panel (p. 9) recommended dropping networking as a reporting area, since it is “a KPA that any good research organization does as a matter of course.”

Perhaps the most controversial reporting requirement for the centres is the monthly cash flow report, which some centres found burdensome and unnecessary. We suggest that it be required in the very early stages of centre development and that the frequency of reports to NRF be decreased after they are established. When DST and NRF put out a new call and start a new cohort of centres, they should carefully consider the use made of information in each report and consult with current centre directors before determining the next round of reporting requirements.
Boards

Another distinctive mandated feature of each centre is its Board, chaired by the head research official of the host institution. Each Board also includes the centre director(s) and members of key stakeholder groups, such as industrial firms or civil society organizations, as relevant to the area of the centre’s work. The Board meets twice a year, once to approve the budget and once for strategy-setting.

The Boards were declared largely successful by the centre participants in the review. How they operated was variable across the centres, particularly in the task of setting strategic directions, where we heard reports that the Boards sometimes lacked the right expertise. One review panel, for example, recommended that the Board should add more experts in the centre’s core research area (Birds p. 9), and also noted that the board should be more pro-active and spend less time merely monitoring performance indicators. This stronger strategic role would match with experience in the U.S. centres programmes. Getting full value from the Boards is an area where centres might usefully learn from each others’ experiences and perhaps international experiences as well.

Research Managers

As mentioned earlier, each centre was required to hire a Research Manager. Surprisingly, in a number of cases these are scientists with doctoral degrees, who have served as significant supports for centre directors and key elements in centre operations. Since the individuals who hold these positions are developing a skill set that is relatively rare in South Africa, building that capacity is an unanticipated benefit of the programme for the research system as a whole.

NRF PROGRAMME MANAGEMENT

As for NRF’s management of the programme, both NRF and the centres report a successful relationship. NRF grants management staff find that the programme is efficient to run because of the strong delegation of financial and performance accountability to the centre Boards. The centres report that their payments almost always arrive on time. Since this relationship involves learning on both sides, continuity of personnel is valuable for both parties, and the centre directors noted the loss when DST and NRF representation at centre Board meetings was not consistent. Both sides noted that NRF could play a more active role in creating opportunities for the centres to learn from each others’ experiences. NRF organized an annual meeting of centre directors early in the life of the programme but this fell away over time. Such a meeting will be particularly important when a new cohort of centres starts up, so that experienced directors can help new ones assume their roles.

All these comments point to the value of having a stable CoE programme officer within NRF, to serve as a steady point of contact and conduit for information. The person previously in this role has moved to other responsibilities. It is very important to replace him quickly with an appropriately competent person, since the programme faces two significant challenges in the next few years, as the first cohort graduates from the programme and a new class enters.

NRF devoted the same amount of money in each year of operation, with a modest increase for inflation. The Strong Materials review panel (p. 14) noted that the agency might consider a different phasing in its next round of funding:
“The Panel felt that the use of committed funds could be better implemented as follows, to take account of the limited span of the funding:

(i) An initial period with a rapid increase in funding for students, followed by a decrease in the final three years. (Though DST/NRF may consider maintaining some funding by bursaries to students beyond the ten year time scale, as described previously.)

(ii) A policy of increasing the budget for equipment funding to a peak around about the five year stage, essentially so that the Centre of Excellence would have maximum benefit of equipment at an early stage.

(iii) Finally, the budget from DST/NRF would begin its decrease towards the end of the ten years so that the Centres of Excellence would have to plan properly for increased funding from other sources. Effectively this means that the end-of-term funding should be partly be advanced to an earlier stage.

This is not a request for extra funding but a recommendation for a different profile of funding which would hopefully help both the Centres of Excellence and DST/NRF.”

PRESENT STATUS

All the CoEs have been extensively reviewed by international experts in the various fields. The high calibre of the members of the specialist review panels was particularly striking. We support the overall finding that all the CoEs have done exceptionally well and are now internationally competitive and some are world leaders. Comments such as “progress since inception can only be described as breathtaking”, “the CoE compares very favourably with other similar institutes in the USA and Britain”, “the CoE has achieved high standards of research excellence, outputs and student training and commands an international profile” etc occur in all the review reports. All the CoEs have met all the aims of the programme. Not only has the output of publications in peer reviewed journals improved but there has been a significant improvement in the impact factors. The stability with regard to funding has enabled the CoEs to undertake long term research in new areas. The CoE Programme fostered collaboration both within and between institutions.

An important aspect of the programme is that it has resulted in the retention of top researchers in SA who otherwise may have left. Furthermore, new researchers and research expertise have been developed. Additional funding and in some cases substantial additional funding, has been attracted as a direct result of the creation of a CoE. The stability of the programme is demonstrated that in three CoEs leadership succession has happened very smoothly and successfully.

The Programme Review Panel agrees with the individual review panels in very strongly recommending the continuation of the programme and the individual CoEs for another five years.
**SPECIAL ISSUES**

1. **South African black students**

   The problem of increasing the number of black students in Masters and PhD science programmes and attracting the resulting highly qualified students into academic and research careers is a major national problem. There are a number of reasons for this and amongst the most important is the maths and science teaching at school level and the salary differences between uncompetitive academic salaries in comparison with government and the private sector. The lack of properly qualified science graduates entering the teaching profession is another cause for concern.

   In spite of these national problems the CoEs have done well and met their targets for black students. However, few of these students are South African and most have been recruited from other African countries. This has resulted in another problem and that is the difficulty of the retention of these students in permanent or contract posts due to work permit restrictions and the problems within the Department of Home Affairs.

   The CoEs have been proactive in the recruitment of black students. This has involved, for example, mentoring programmes at undergraduate level, development of school programmes including the generation of teaching materials and nodes at previously disadvantaged universities.

   Some of the CoEs have done exceptionally well in attracting women into their Masters and PhD programmes.

2. **Influence of Research Chairs**

   The creation of the Research Chairs occurred after the founding of the CoEs. Some of the Directors of the CoEs perceived that these Chairs are more prestigious than being a Director of a CoE. Reasons given are the 15 as opposed to 10 year time frame, the funding is better since it is not shared with other participants, the administration is less complex and the recognition within individual institutions is greater.

   There is no doubt that both initiatives are essential for SA and need to continue. Both are enhancing excellence in research and the training of much needed research students. The DST/NRF need to manage the perceptions of researchers and institutions so that both initiatives flourish.

**WORKING TOWARDS YEAR TEN FOR THE PRESENT CoEs**

The Programme Review Panel accepts that there should be a fixed term for CoEs. However, we are concerned that what has been developed in each CoE should not be allowed to disintegrate and disappear. We recommend that the CoEs and their Boards must begin planning now for the continuation of the activity after year ten. This may be in a different form but the excellent research and training must continue. Furthermore, the institutional collaborations which are more likely to dissolve, should
be maintained. Since funding will be the major requirement for continuation, it will probably be easier for industrially connected CoEs to obtain the required funding. Where possible this should be done without prejudicing the fundamental research component of the respective CoEs.

To facilitate this transition the DST/NRF has an important role. They should investigate international examples regarding successful transitions. DST/NRF should initiate discussions with universities and relevant research councils to be proactive in providing support for the continuation of the CoEs, particularly regarding the funding of essential posts.

Of particular concern is the continuation of student support from year seven up to and beyond year ten. If this is not done the CoEs will begin disintegrating from year seven. An example of what could be done is traineeship grants following the model at the National Institutes of Health in the USA.

DST/NRF should consider making Centre directors eligible for consideration as South African Research Chairs for a further five years after the completion of the ten year CoE. This would resolve the tension between the ten and fifteen year differentials in the respective programmes.

CONTINUATION OF THE PROGRAMME

International experience shows that centre programmes are most effective when they are renewed through open calls at intervals of 3-5 years, producing rolling cohorts of new centres as older ones graduate from the programme into independent funding.

The Programme Review Panel very strongly recommends the continuation of the programme. The enormous success of the seven initial CoEs is evidence of the importance of the programme. Another open competitive competition should be initiated as soon as funds are available. Different models can be supported over time such as the present initiative to involve Government Departments in providing funding to the NRF for the creation and management of CoEs in particular areas. In this regard the principle of an open and competitive process must be followed.

BOTTOM UP AND TOP DOWN

We strongly recommend the bottom up approach in the creation of CoEs. This ensures that excellence within the research system is rewarded. It is an open system and allows creative ideas to emerge. Since it is open and transparent it is accepted by peers. As mentioned above if special areas are selected, there should still be open competition in bidding for such a centre. Specialized and open-call centres are both important, and one should not replace the other in the overall programme.

RECOMMENDATIONS

- The DST/NRF should continue funding each of the individual CoEs for a further five years.

- The DST/NRF should continue the CoE Programme and run another bottom-up competition as soon as possible.
- The DST/NRF should encourage other Government Departments and Research Councils to participate in the centres programme by funding to the NRF for the creation and management of specialized centres awarded on an open and competitive basis.

- The DST/NRF should develop strategies to prevent the loss of critical mass and expertise that has been developed, e.g., eligibility for Research Chairs and support for research students.

- The centres and their Boards should start immediately to plan for the Year Ten transition.

ACKNOWLEDGEMENTS

We would like to thank NRF for the efficient organisation of the review process, and more particularly Anke Rädel and her team for their excellent support.
Appendix 1

REVIEW OF DST/NRF CENTRES OF EXCELLENCE (CoE) PROGRAMME

PROGRAMME ARRANGED FOR THE REVIEWERS:

- PROF SE COZZENS, GEORGIA TECH UNIVERSITY, USA
- PROF DR WOODS, SYNEXA INSTITUTE FOR BIOSPROSPECTING, SOUTH AFRICA

Tuesday, 23 June 2009

Arrival in Pretoria

Accommodation for duration of review:

The Cornerstone Guest Lodge, Camellia Avenue, Lynnwood Ridge, tel. +27 12 361-8100, fax +27 12 348-4792 or 086 5116621, mobile +27 82 5712110, e-mail info@cornerstonelodge.co.za

Wednesday, 24 June 2009

Venue: FW de Klerk Meeting Room, NRF

08:30 – 09:00 Welcome and briefing by Dr Andrew Kaniki, NRF Executive Director: Knowledge Fields Development also in attendance:
Ms Joyce Olivier, Manager: Monitoring and Evaluation (M&E)
Ms Anke Rädel, Professional Officer: M&E
Dr Daisy Selematsela, NRF Executive Director: Knowledge Management and Evaluation

09:00 – 10:00 Closed session by panel members to discuss strategy

10:00 – 10:50 Mr Sibongile Sowazi, Grant Director: CoE and SARChi Programmes, Grant Management and Systems Administration, NRF

10:50 – 11:30 Ms Anati J Canca, Executive Director: Technology Transfer, Agricultural Research Council

11:30 – 12:10 Representative of Department of Science and Technology
Mr Bheki L Hadebe, Manager: Human Capital-High End Skills

12:10 – 16:30 Appointments with Directors of DST/NRF Centres of Excellence (CoE)

12:10 – 12:40 Prof Phil Hockey, Director: DST/NRF CoE in Birds as Keys to Biodiversity Conservation

12:40 – 13:10 Prof Valerie Mizrahi, Director: DST/NRF CoE for Biomedical TB Research

13:10 – 13:40 Prof Lesley Cornish, Director: DST/NRF CoE in Strong Materials
Venue: Desmond Tutu Meeting Room, NRF
13:40 – 14:20 lunch with:
Prof Lesley Cornish

Venue: FW de Klerk Meeting Room, NRF
15:10 – 15:40 Prof Michael Claeys, Director: DST/NRF CoE in Catalysis
Dr Rein Weber, Manager: DST/NRF CoE in Catalysis
15:40 – 16:00 tea/coffee and closed discussion
16:00 – 16:30 Prof Mike Wingfield, Director: DST/NRF CoE in Tree Health Biotechnology
16:45 – 17:15 Prof John Hargrove, Director: DST/NRF CoE in Epidemiological Modelling and Analysis (by teleconference)

Thursday, 25 June 2009
Venue: FW de Klerk Meeting Room, NRF
09:00 – 10:00 Dr Rob Drennan, Executive Director: Grant Management and Systems Administration, NRF
10:00 – 10:15 tea/coffee
10:15 – 13:00 preparation for review report
13:00 – 13:30 lunch
13:30 – 16:30 preparation for review report

Friday, 26 June 2009
Venue: FW de Klerk Meeting Room, NRF
09:00 – 10:00 follow-up questions with NRF staff, if required/report writing
10:00 – 10:15 tea/coffee
10:15 – 13:00 report writing
13:00 – 13:30 lunch
13:30 – 14:30 finalisation of review report
Venue: NRF Auditorium

14:30 – 15:30 verbal feedback to representatives of DST, NRF and other interested parties:

Prof Robin Crewe, Vice-Principal, University of Pretoria
Prof Lesley Cornish
Prof Brenda Wingfield, Research Leader, DST/NRF CoE in Tree Health Biotechnology
Prof Mike Wingfield

NRF staff:
Dr Rob Drennan
Dr Andrew Kaniki
Dr Romilla Maharaj, Executive Director: Human and Institutional Capacity Development
Ms Joyce Olivier
Dr Tally Palmer, NRF Executive Director: Applied Research and Innovation
Ms Anke Rädel
Dr Daisy Selematsela
Ms Makhupu Selepe, Professional Officer: M&E

16:00 depart for airport/accommodation
Appendix 2

TERMS OF REFERENCE

REVIEW OF THE
DST/NRF CENTRES OF EXCELLENCE PROGRAMME

1. Assignment title

Review of the DST/NRF (Department of Science and Technology/National Research Foundation) Centres of Excellence Programme including the performance of the individual Centres of Excellence

2. Background

Centres of Excellence (CoE) are physical or virtual centres of research which concentrate existing capacity and resources to enable researchers to collaborate across disciplines on long-term projects that are locally relevant and internationally competitive in order to enhance the pursuit of research excellence and capacity development. The DST/NRF CoE Programme and the individual CoE are sponsored by DST and the operational management of the Programme is managed by the NRF.

The following seven CoE have been established:

- DST/NRF CoE for Biomedical TB Research to research new tools for the diagnosis, treatment and prevention of tuberculosis (established in September 2004)
  Co-directors: Prof Valerie Mizrahi, University of the Witwatersrand, and Prof Paul van Helden, Stellenbosch University;
- DST/NRF CoE in Birds as Keys to Biodiversity Conservation to focus on understanding and maintaining biodiversity using birds as indicators (established in September 2004)
  Director: Dr Phil Hockey, University of Cape Town;
- DST/NRF CoE for Invasion Biology to address the biodiversity consequences of biological invasions (established in August 2004)
  Director: Prof Steven Chown, Stellenbosch University;
- DST/NRF CoE in Tree Health Biotechnology to concentrate on understanding and combating diseases affecting South Africa’s indigenous trees (established in September 2004)
  Director: Prof Mike Wingfield, University of Pretoria;
- DST/NRF CoE in Catalysis to drive innovation in catalysis, a key process in the chemical and manufacturing sector (established in September 2004)
  Director: Prof Michael Claeyys, University of Cape Town;
- DST/NRF CoE in Strong Materials to seek to understand and improve the properties of advanced strong materials to increase their efficiency and reduce their cost (established in September 2004)
  Director: Prof Lesley Cornish, University of the Witwatersrand;
- DST/NRF CoE in Epidemiological Modelling and Analysis to use mathematics to understand, predict and ultimately combat diseases (designated by DST and established in March 2006)
  Director: Prof John Hargrove, Stellenbosch University).
In terms of the agreement with the DST, reviews of the performance of the CoE involving international review panels are to be scheduled at regular intervals.

3. **Assignment Principal and Review Reference Group**

The Assignment Principal is the NRF represented by the Vice-President. The Review Reference Group comprises the Vice-President of the NRF and five members appointed by the Vice-President of the NRF.

The role of the Review Reference Group will be to:

- approve the terms of reference;
- recommend the budget;
- approve the members of the international review panels;
- approve the review plan and time frames for the review process;
- consider and suggest suitable interviewees for the review panels;
- meet under the direction of the Chair of the Review Reference Group, as required;
- accept the draft and final reports by the review panels;
- accept the responses of the management of the CoE to the reports;
- ensure that the individual review reports addressed the ToR.

4. **Service provider**

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

- develop the terms of reference for the review;
- prepare the letters of invitation for the approved members of the review panels for the Assignment Principal’s signature and distribution;
- develop a programme for the review, including a budget;
- coordinate and manage the entire review process, including logistics;
- provide support to the review panels;
- source the necessary documents stipulated in the Appendix with the help of the staff of the DST/NRF CoE Programme and make them available to the review panels six weeks prior to the commencement of the respective reviews in South Africa;
- receive the preliminary and final reports by the review panels and submit them to the Assignment Principal for further action;
- forward the preliminary and final reports by the review panels to the RRG for acceptance;
- place the final review reports on the NRF website within one month of the acceptance of the review reports by NRF management.

5. **The purpose of the review**

The purpose of the review will be twofold, i.e. firstly, to assess

- the conception, implementation and management of the DST/NRF CoE Programme from inception to 30 June 2008; and
- the performance of the individual DST/NRF CoE from inception to 30 June 2008 in terms of their respective mandates

and, secondly, to make recommendations for the future to enhance the
• DST/NRF CoE Programme; and
• performance of the individual DST/NRF CoE.

6. **The scope of the review**

The focus of the review will be a retrospective view covering the periods since the dates of inception to the present of the DST/NRF CoE Programme as well as the respective seven DST/NRF CoE. The prospective view will cover the future goals to which the Programme and the individual CoE should strive.

7. **Review dimensions**

As outlined in Item 9 below seven panels will be appointed to review each of the DST/NRF CoE and a further panel will be assessing the DST/NRF CoE Programme. The latter panel will also consider the reports and findings of the reviews of the seven CoE when compiling its report.

7.1 **Seven DST/NRF CoE**

The separate panels appointed for each of the seven DST/NRF CoE are requested to assess the performance of the CoE in terms of their respective mandates stipulated in the approved proposals submitted to the NRF and their subsequent evolution under the guidance of the Advisory Boards. The mandates of the CoE are clustered around the key performance areas (KPAs) given below. The reviewers are expected to address all the KPAs.

7.1.1 Research

The main activity of CoE is research. The work that is undertaken should be focused on the creation and development of new knowledge and/or technology. In meeting this responsibility, the gender relevance of all research undertakings should be made explicit.

7.1.2 Education and training

Human resource development is to be done through masters and doctoral programmes, post-doctoral support, internship programmes, support for students to study abroad, joint ventures in student training, etc. In creating, broadening and deepening research capacity, a CoE needs to pay particular attention to racial and gender disparities.

7.1.3 Information brokerage

CoE are to provide access to a highly developed pool of knowledge, maintaining data bases, promoting knowledge sharing and knowledge transfer, etc.

7.1.4 Networking

A CoE is expected to actively collaborate with reputable individuals, groups and institutions. Equally it must negotiate and help realise national, regional, continental and international partnerships, etc.

7.1.5 Service rendering

A CoE is to provide information, analysis, policy, and other services, including informed and reliable advice to government, business and civil society.

7.1.6 Management of CoE in terms of:

- leadership
- staffing
- commitment of institution hosting the CoE
- location of the CoE
- funding
- strategic positioning of the CoE and future plans.
(For further details please refer to Item 5 of the NRF framework for CoE in the South African System of Research and Innovation dated May 2003.)

7.1.7 In addition, the individual panels reviewing the seven DST/NRF CoE are also requested to address the conception, implementation and management of the DST/NRF CoE Programme from their perspective.

7.2 DST/NRF CoE Programme

The panel is requested to assess the performance of the NRF in terms of

7.2.1 conceiving, implementing and managing the DST/NRF CoE Programme to date in accordance with the objectives as specified in the CoE Strategic Plan, CoE Programme Business Plan and the Guide;

7.2.2 addressing the aims of the DST/NRF CoE Programme, i.e. to:
- exploit the competitive advantage vested in outstanding researchers;
- reward, retain, sustain and improve scientific excellence;
- integrate smaller and related research initiatives into one programme;
- achieve economies of scale through the optimization of resources and effort by sharing personnel, equipment, data and ideas;
- provide secure and stable funds for research and knowledge dissemination;
- support planned, strategic, long-term research;
- reduce micro-management of academics and their resources by the funding agency;

7.2.3 future plans of the CoE Programme;

7.2.4 providing administrative and other logistical support for CoE Programme operations.

8. The review structure and process

8.1 A panel consisting of at least two members will be appointed for the review of each DST/NRF CoE. Ideally, one member should be a scientific expert from abroad in the particular field of the CoE and one member with
appropriate experience and skills should be from South Africa. Each panel
will be requested to compile a report.

8.2 A panel comprising of at least two members with appropriate expertise in
science/innovation policy matters and experience in running large
programmes/centres will be appointed to review the DST/NRF CoE
Programme and to compile a report including comments on the findings and
recommendations of the seven individual reports on the CoE.

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

8.4 The service provider will draw up a programme for the review in
consultation with the Assignment Principal and the management of the
DST/NRF CoE Programme. The panels will have the opportunity to
interrogate the proposed programmes and to recommend amendments and
additions should the need arise.

8.5 The panels will have the opportunity to interview members of the individual
CoE (including their beneficiaries and students) and staff of the DST/NRF
CoE Programme and as well as other relevant stakeholders.

8.6 The review panels will decide on and pursue their own line of questioning
during interviews.

9. Deliverables by

9.1 Directors of CoE (These will be requested from the Directors of the
CoE by the service provider.)

9.1.1 Self-evaluation reports compiled by the individual CoE for transmission to
the review panels at least seven weeks prior to the commencement of the
review programme in South Africa. The reports should address the KPAs
(see items 7.1.1 to 7.1.6 above) and should cover the period since inception
of the CoE up till June 2008 and should not exceed 40 pages with
annexures. Details of the requirements for the reports will be provided by
the Service Provider.

9.1.2 List of stakeholders
Appointments/discussions with stakeholders will be arranged for the review
panels to facilitate their tasks. CoE will therefore be requested to supply
the names of stakeholders with whom the CoE is currently interacting, will
be interacting in the future and should be interacting but for some reason
has not been able to do so yet. It would be helpful, if the names could be
clustered under the headings research, education and training, information
brokerage, networking, service rendering and management (cf Items 7.1.1
to 7.1.6 of the ToR) and if the critically important stakeholders are
highlighted or appear in bold.

9.1.3 Concise information on the funds received by the CoE from national
(including all sources in the NRF) and international sources per year for the
period under review.

9.1.4 List of documents considered to be essential reading for the review panels
and other documentation which should be accessible to reviewers during the
review.

9.1.5 Names, affiliations and contact details of possible reviewers for
consideration.
9.1.6 Written responses to the final review reports. These will also be placed on the NRF website.

9.2 by DST/NRF CoE Programme
Documents listed on the Annexure to the terms of reference for the review which are not in the public domain are to be supplied to the Service Provider for onward transmission to the review panels four weeks in advance of the commencement of their respective programmes in South Africa;

9.3 by Review panels
9.3.1 Verbal feedback to Directors of CoE as well as representatives of DST and NRF;
9.3.2 Preliminary reports on completion of the stakeholder interviews;
9.3.3 Final reports within two weeks of completion of the stakeholder interviews. The reports should include:
    • an executive summary;
    • background to the review;
    • evaluation questions that were addressed;
    • key findings;
    • recommendations;
    • conclusions;
    • appendices containing, e.g. terms of reference, persons interviewed.

10. Time frame
Preparations for the review will commence in 2008 but the programme involving the reviewers will take place during the first quarter of 2009 depending on the availability of suitable reviewers.

11. Budget
The service provider will submit a budget for the review to the management of the DST/NRF CoE Programme Executive for approval and payment.

*The terms of reference may be amended in consultation with the Directors of the CoE should the need arise.*
DOCUMENTS FOR THE REVIEW PANELS

ESSENTIAL READING

General

- Memorandum of agreement entered into between the Department of Science and Technology and the National Research Foundation, 2004
- Guide to funding of Centres of Excellence, February 2004
- Handbook to assist with the operation of a Centre of Excellence, April 2004
- The NRF Framework for Centres of Excellence in the South African System of Research and Innovation, May 2003
- NRF Strategic Plan 2000
- Strategic Plan of the NRF – NRF Vision 2015

Documents specific to individual Centres of Excellence

DST/NRF CoE for Biomedical TB Research

- Self-evaluation report by CoE
- Service Level Agreement June 2004
- 2004 Annual Progress Report
- 2005 Business Plan dated 09.11.2004
- 2005 Annual Progress Report
- 2006 Annual Progress Report
- Service Level Agreement February 2005
- 2006 Business Plan dated 07.10.2005
- Service Level Agreement March 2006
- Service Level Agreement February 2007
- 2007 Business Plan
- 2008 Business Plan
- 2009 Business Plan

DST/NRF CoE in Birds as Keys to Biodiversity Conservation

- Self-evaluation report by CoE
- 2004 Business Plan dated 03.03.2005
- 2004 Annual Progress Report dated 03.03.2005
- Service Level Agreement dated 03.03.2005
- 2005 Business Plan dated 03.03.2005
- 2005 Annual Progress Report dated 27.03.2006
- Service Level Agreement dated 27.03.2006
- 2006 Business Plan dated 08.11.2005
- 2006 Annual Progress Report dated 27.03.2007
- Strategic Plan (2005-1014) dated 08.11.2005
- Service Level Agreement dated 27.03.2007
- 2007 Business Plan dated 07.11.2005
- 2007 Annual Progress Report dated 27.03.2008
- 2008 Business Plan dated 17.10.2007
- The National Biodiversity Strategy and Action Plan, Department of Environmental Affairs and Tourism, 2005
DST/NRF CoE for Invasion Biology

- Self-evaluation report by CoE
- 2004 Annual Progress Report dated 16.03.2005
- Service Level Agreement dated 16.03.2005
- 2005 Annual Progress Report dated 16.03.2006
- Strategic Plan (2004–2005) dated 16.03.2005
- Service Level Agreement dated 26.10.2005
- 2006 Annual Progress Report dated 30.03.2007
- Service Level Agreement dated 30.03.2007
- 2007 Annual Progress Report dated 20.03.2008
- The National Biodiversity Strategy and Action Plan, Department of Environmental Affairs and Tourism, 2005

DST/NRF CoE in Tree Health Biotechnology

- Self-evaluation report by CoE
- Service Level Agreement dated 18.04.2005
- 2005 Annual Progress Report dated 08.05.2006
- 2006 Business Plan dated 31.10.2005
- 2006 Annual Progress Report dated 07.05.2007
- Service Level Agreement dated 07.05.2007
- 2007 Annual Progress Report dated 12.05.2008
- 2008 Business Plan dated 12.05.2008
- A National Biotechnology Strategy for South Africa, Department of Science and Technology, 2001

DST/NRF CoE in Catalysis

- Self-evaluation report by CoE
- 2004 Annual Progress Report dated 01.03.2005
- Service Level Agreement dated 01.03.2005
- 2005 Business Plan dated 01.03.2005
- Service Level Agreement dated 23.03.2006
- 2006 Business Plan dated 29.09.2005
- 2006 Annual Progress Report dated 28.03.2007
- Service Level Agreement dated 18.10.2007
- 2007 Business Plan dated 03.10.2006
- 2007 Annual Progress Report dated 12/03/2008
- 2008 Business Plan dated 18.10.2007
- A National Advanced Manufacturing Technology Strategy for South Africa

DST/NRF CoE in Strong Materials

- Self-evaluation report by CoE
- 2004 Annual Progress Report dated 08.04.2005
Service Level Agreement dated 08.04.2005
Service Level Agreement dated 07.07.2005
2006 Annual Progress Report (not dated)
Service Level Agreement dated 31.07.2006
2007 Business Plan (not dated)
The National Nanotechnology Strategy

DST/NRF CoE in Epidemiological Modelling and Analysis

Self-evaluation report by CoE
2006 Business Plan (not dated)
2006 Annual Progress Report (not dated)
Service Level Agreement dated 18.01.2007
2007 Annual Progress Report dated 28.03.2008

Documents specific to Centre of Excellence Programme

Self-evaluation report by CoE Programme
Seven self-evaluation reports by individual DST/NRF Centres of Excellence
Seven review reports on individual DST/NRF Centres of Excellence
Seven responses by DST/NRF CoE management to review reports
Power Point presentation of strategic clustering of CoE applications
Power Point presentation of 2004/5 Business Plan of Centre of Excellence Programme
Centre of Excellence Programme Business Plan 2004
Centre of Excellence Programme Business Plan 2006
Extract: CoE input into RISA Annual Report 2006/7
Introducing South Africa’s Centres of Excellence – Taking the lead in cutting-edge research

ADDITIONAL READING

General

DST/NRF Centres of Excellence: Summary of Assessment and Selection Process used during the call of 2003/2004
White Paper on Science and Technology
South Africa’s National Research and Development Strategy
OECD report on the National System of Innovation in South Africa
Ten-year Innovation Plan of the Department of Science and Technology
Human Capital and the South African Knowledgebase