

**QUINQUENNIAL REVIEW
OF THE
COUNCIL FOR THE CENTRAL LABORATORY
OF THE RESEARCH COUNCILS**

STAGE TWO

“IMPROVING PERFORMANCE”

APRIL 2002



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“As part of the more strategic approach to infrastructure planning, the Government is reviewing the Council for the Central Laboratory of the Research Councils (CCLRC) which operates major national research facilities for Research Councils and universities. While other elements of the structure of Research Councils put in place by the last White Paper ‘Realising our Potential’ are working well, the CCLRC was not given a clear mission or proper funding arrangements; we should now do so.”

[Extract from the July 2000 White Paper ‘*Excellence and Opportunity. A Science and Innovation Policy for the 21st Century*’, Cmnd 4814].

EXECUTIVE SUMMARY

1. This is the report of the second stage of the Quinquennial Review (QQR) of the Council for the Central Laboratory of the Research Councils (CCLRC). Since Stage One of the review, membership of the Council has been changed to include five of the Chief Executives of the other Research Councils. Additionally, a new strategy body named 'Research Councils UK' (RCUK), announced in the second stage report of the Quinquennial Review of the other Research Councils (December 2001), is to be established. Membership of this new body will comprise the Director General for the Research Councils and the Chief Executives of all the Research Councils, including the CCLRC (conditional on the outcome of the CCLRC QQR).
2. The science and engineering programmes undertaken at the CCLRC range from materials science, physics, chemistry, mathematics and the life sciences, to computer science and engineering, particle physics, space science and astronomy and Earth observation. Technology programmes at the CCLRC include, among others, accelerator-based technologies, information technologies, instrumentation and e-Science. It is the proximity of a critical mass of capabilities - across a broad set of disciplines - that marks out the strength of the CCLRC. These scientific, technical, educational and organisational capabilities, together with the large-scale facilities and their specialist supporting infrastructure, constitute an integral part of the UK science and engineering base.
3. One of the major recommendations of Stage One was that the CCLRC should seek to fulfil a more strategic role in the provision of access to leading edge, large scale, facilities for UK researchers. In this Stage Two report, **we recommend that the CCLRC is given the strategic role identified in Stage One – and should act, on behalf of the RCUK and the other Research Councils, as the national focus for large scale facilities for neutron scattering, synchrotron radiation and high power lasers.** The new arrangement, if implemented, would provide a clearer focus within the UK, not least for the research communities that use the facilities. It would also provide an opportunity for a more improved and strategic interface with the UK's international partners in these areas.
4. There are changes in other European countries and beyond that are intended to strengthen the coordination of policies and strategies for large-scale facilities. It is essential that the UK is positioned so as to be able to contribute to and benefit from close engagement with these new approaches. The CCLRC is well placed to take on this role for the UK. The CCLRC has access to a broad range of technical skills and capabilities essential for realising the next generation of facilities. It also has extensive international contacts and, in future working arrangements with the Foreign and Commonwealth Office, is looking to strengthen these still further.
5. Through working closely with the grant-awarding Research Councils the CCLRC can also ensure that emerging science requirements can be captured. By bringing together technical options and opportunities for international partnerships, with the science requirements, the CCLRC will be able to provide the RCUK with the necessary long-

term strategic advice on the large-scale facility portfolio for the UK. Such advice can be expected to play a key role in enabling the strategic ‘road-map’ of large scale facilities, recently published by the Office of Science and Technology (OST), to be rolled forward – a requirement identified in the recent Quinquennial Review of the grant-awarding Research Councils.

6. **It is further proposed that responsibility for managing the UK subscription to the European Synchrotron Radiation Facility (ESRF) and to the Institut Laue Langevin (ILL) be transferred to the CCLRC - alongside that for diamond and the UK contribution to the European Spallation Source international R&D programme – under the strategic direction of the RCUK.** The outcome of this would be to place the CCLRC in a better position to co-ordinate the UK strategic programme for investment in synchrotron sources (the SRS, ESRF, diamond and the proposed Fourth Generation Light Source) and in the neutron facility programme (ISIS, ILL, and the proposed third generation neutron source).
7. The determination of strategy will draw on a wide constituency of stakeholders, both nationally and internationally. **Within the CCLRC, the drawing together and provision of strategic advice on large-scale facilities for the RCUK should be carried out separately from the day-to-day management and operation of its own facilities.** Clearly separating strategy and operations will assist the CCLRC in providing independent, objective, appraisal of strategy in a manner similar to other Research Councils that own research institutes and facilities.
8. One of the requirements identified at Stage One was the need to establish a model for strategic ownership of the current large-scale facilities and their associated development programmes. At the heart of the arrangements proposed in Stage Two lies the responsibility of the CCLRC for facility operations, for the strategic management of continuing investment in the facilities (within the UK and overseas) and for the provision of key technical capabilities essential for the continuing development of the facilities.
9. **The CCLRC and the other Research Councils need to develop a more effective strategic partnership in order to ensure that the UK obtains the maximum value for money from the major public investments in the existing suite of large-scale facilities.** They will need to work together to determine the operating capacity and capability for each facility since these, too, will serve to influence the demand from users. The CCLRC should be the ‘agent’ for the other Research Councils in the delivery of facility operations. It will be for the CCLRC to ensure that the service levels required from the large-scale facilities meet the requirements of both the Research Councils and the research communities that they sponsor.
10. One area of difficulty in recent years has been the diversity of facility access arrangements that has existed across the Research Councils. While each has been developed to meet particular requirements for competitive review, or to meet the needs of individual research communities, the resulting diversity has presented a confusing picture to the research communities overall.
11. **We propose a common facility access scheme for researchers sponsored by all Research Councils. The essence of the scheme is that, for those experimental proposals that are recognised under competitive peer review as being of high**

quality and are technically competent, access shall be made available under a ‘free at the point of access’ arrangement. This will not only align access arrangements for all academic users, independent of which Research Council sponsors their research, but it will also align access procedures for national facilities with those in place for international facilities to which the UK subscribes.

12. Stage One recommended that further consideration be given to the proposal that the CCLRC adopt Limited Company status and this has been done. **We have reached the clear conclusion that for its core business the CCLRC should remain a Non-Departmental Public Body (NDPB) and a Research Council.**
13. There are, however, several areas where the ability of the CCLRC to function through a company structure would have distinct advantages. The Stage One review did not make a sufficient distinction between the public science and commercial activities of the CCLRC. In Stage Two we have seen merit in the advantages to be gained in separating the commercial prospects for the CCLRC’s enterprise from the public sector programmes. As a result, **we strongly endorse the plans of the CCLRC to establish a company to handle its commercially based activities.**
14. The provision of proper funding arrangements for the CCLRC was a concern of the Government’s July 2000 White Paper ‘*Excellence and Opportunity*’. **We recommend that consideration be given to the provision of direct funding of the CCLRC for facility operations, from the OST. The key to the provision of funding should be the agreement of each of the funding Research Councils to a new medium term plan for operational requirements for each of the large-scale facilities. To provide for the close and continuing engagement of the other Research Councils we recommend that the CCLRC jointly agrees with them a series of metrics for the quality of science undertaken on the facilities.**
15. The evaluation framework proposed by the CCLRC will include the regular ‘benchmarking’ of operations against those of other international facility operators. This will enable scrutiny of best practice in facility operations and will provide a basis for building further confidence among all stakeholders in the efficiency and effectiveness of the CCLRC operations. **We recommend that the CCLRC agrees, jointly with the other Research Councils, a series of performance measures and targets designed to demonstrate the value for money achieved.**
16. **We recommend, too, that consideration be given to the more effective management of support infrastructure costs for the CCLRC. It might also be the case that funding for these, too, should be provided directly by the OST.** The CCLRC should work closely with other landholders adjacent to its sites, for example in seeking to develop an effective and economic plan for site support and development. This should include considering the extent to which the private sector might be involved.
17. **Maintaining the leading edge technical capabilities of the CCLRC, development of the new strategic role and the pursuit of a wider public engagement in its programmes (the third Charter objective) are areas where the direct funding of the CCLRC would enable it better to fulfil its mission and to be directly accountable for its performance and its achievements. We recommend that funding for these areas, including a modest provision for administration, also be given further consideration by the OST.**

18. **The report sets out a number of areas where we recommend that the CCLRC look to secure key improvements in organisational performance.** These range from the development of an evaluation framework that will encompass all of the CCLRC's activities, to the control of indirect costs and the improved economic management of fixed assets.
19. We recognise that the outcome of Stage Two represents a substantial and continuing programme of change that will require a high quality of management and leadership from within the CCLRC. Equally, the proposals arising from the Stage Two exercise represent a considerable opportunity to build the clear mission and proper funding arrangements for the CCLRC that were looked for at the onset of the Quinquennial Review. The advantages that can be contemplated for the Science Budget in bringing together the proposed range of activities under the responsibility of the CCLRC, effectively for the first time within the UK, are considerable. The CCLRC will provide the sought for focus, within the Research Councils, for large scale facilities alongside a wider set of science, technology and engineering capabilities - a position that can be expected to have wide impact and significant benefits.

CCLRC QQR Reference Group

March 2002

CHAPTER ONE: INTRODUCTION

20. Stage One of the Quinquennial Review of the CCLRC focused on whether the current organisation and status was '*right for science*'. Stage Two has addressed the findings of Stage One and includes a particular focus on '*improving performance*' for both programme and organisational management.
21. The Stage Two exercise has been conducted with the close guidance of the Office of Science and Technology (OST) and an external Reference Group nominated by the OST. The group members had all been involved in the Stage One process and were: Sir Peter Williams (Chairman, Engineering and Technology Board) (Chair); Sir George Radda (Chief Executive, Medical Research Council); and Sir Christopher Llewellyn-Smith (Provost, University College London). In the later stages of the exercise the group was joined by Dr David Grant (Vice Chancellor, Cardiff University), who had also served as a member of the Stage One exercise and had since been appointed a member of the Council of the Engineering and Physical Sciences Research Council (EPSRC). Discussions have also been held with the other Research Councils directly involved.
22. Stage Two (QQR2) for the CCLRC has been conducted against a changing external environment. Firstly, the other Research Councils have been involved in a similar Stage Two exercise. Secondly, the OST, together with all the Research Councils (including the CCLRC), has been giving further consideration to the means by which more effective strategic development and co-ordination of programmes funded through the Science Budget can be achieved. The intent behind these two related actions has been to create an environment in which all the Research Councils can operate, strategically, effectively and flexibly in response to changing circumstances and in a timely manner.
23. One of the more significant outcomes of these discussions and reviews has been the proposal that a strategy group 'Research Councils UK' (RCUK) be set up by the Research Councils and the OST. Membership of the RCUK will be the Director General for the Research Councils and the Chief Executives of the seven Research Councils (for CCLRC, this remains conditional on the outcome of its QQR). The aim is to enhance the collective leadership and influence of the Research Councils and to encourage cross-Research Council collaboration both at strategic and operational levels. The view is that the OST, with the RCUK and others, should develop a longer-term forward vision for science, which underpins the consideration of future priorities, including the opportunities for international partnerships.
24. It is at this stage of the new developments that the two separate exercises, namely the QQR2 reviews for the CCLRC and for the other Research Councils, have come together.
25. While the principal thrusts of the Stage One and Stage Two reviews have been concerned with the CCLRC's role in the management of large-scale facilities, it is important to note that the CCLRC programme is far broader. The science and engineering programmes undertaken at the CCLRC range from materials science, physics, chemistry, mathematics and the life sciences, to computer science and engineering, particle physics, space science and astronomy and Earth observation.

Technology programmes at the CCLRC include, among others, accelerator-based technologies, information technologies, instrumentation and e-Science. The participation of the CCLRC in these areas can also involve the operation of large-scale research facilities (for neutron scattering, synchrotron radiation and high power lasers) alongside smaller research and test facilities (for example, the molecular spectroscopy facility, the environmental test facility and the European Space Agency fast track technology centre).

26. In the second stage of the QQR of the other Research Councils consideration was given to the criteria, which could indicate whether a strategic case for creating or retaining a particular ‘research institute’ had been met. With these criteria as a starting point, and recognising the breadth of its programme, the strategic case for the CCLRC can be identified. Within its fields of competence the CCLRC can provide:
- a national capability and source of advice to Government;
 - a critical mass of research capability, effort and expertise, able to be deployed to provide enhanced research productivity, visibility and exploitability or to rapidly strengthen an underdeveloped research area;
 - the provision of a full-time research-centred environment;
 - the enabling of research by others through the provision of access to leading-edge large scale facilities (for neutrons, synchrotron radiation and high power lasers);
 - the fostering of coordinated and cooperative multidisciplinary approaches to a research area;
 - the development of a long-term research vision and strategy;
 - the enabling of long-term survey, monitoring and data management activities underpinned by research;
 - the opening up of career paths and opportunities that may not be available within university or faculty structures;
 - the development and provision of services;
 - opportunities for greater investment in capital equipment and the skills of support staff, because of the more stable environment;
 - a platform for strategic partnerships with UK academic institutions and other science and technology organisations;
 - a platform for long-term international collaboration and cooperation.
27. It is the proximity of a critical mass of the above capabilities - across a broad set of disciplines - that are not found together in academe that marks out the strength of the CCLRC. These scientific, technical, educational and organisational capabilities, together with the large-scale facilities and their specialist supporting infrastructure, constitute an integral part of the UK science and engineering base. It is, therefore,

essential that the CCLRC is able to bring its advice alongside wider strategic considerations to be applied to the determination of priorities for Science Budget allocations.

28. It is also important to note that, as with Stage One, the Stage Two review has sought only to address those large-scale facilities that lie within the fields of competence of the CCLRC, that is facilities for neutron scattering, synchrotron radiation and high power lasers. There are, also, several smaller scale facilities that the CCLRC operates on behalf of a number of different sponsors that are not given special attention in this review. Neither is attention given to other large-scale facilities such as those involved in space satellites, ground-based astronomy and geophysical radars and particle physics. Other arrangements exist for these – including UK interests in the European Space Agency and CERN (the European organisation for nuclear research) - that are managed by others.
29. The balance between funding for large scale facilities and other programmes; the scientific direction for the large-scale facility programmes; the realisation of prospects for international partnership; and, the appraisal of technical options for the next generation of national and international facilities are all key strategic issues that will require the attention of the proposed RCUK. Recognition of this highlights the role that the CCLRC, as one of the seven Research Councils, should fulfil. As a Research Council, and as a member of the RCUK, the CCLRC can provide direct and independent advice in these areas.
30. Notwithstanding this, there does remain to be settled in practice the nature of the precise working relationship between the RCUK, the CCLRC and the other Research Councils. This applies both to management of the UK strategy for the large-scale facility portfolio and to the determination of scientific requirements. We have been encouraged by the degree of interaction and common cause between the Research Councils in planning the agenda for the RCUK. We believe that the two new fora - that is, the RCUK and the new Council for the CCLRC (see Chapter Two) - can, between them, provide a viable basis for the strategic engagement of key stakeholders in the management of large-scale facilities and in the priorities associated with these within the Science Budget.
31. **There is a real opportunity to improve the effectiveness of the Science Budget by addressing the strategic issues involved in managing the UK large-scale facility portfolio through the closer working - or strategic partnership – between the Research Councils that we are recommending. It is essential that the CCLRC and its independent advice are placed at the heart of these processes – and that guidance and strategic direction is provided by the RCUK.**
32. On a separate but related point, in the course of recent months the OST has given further consideration to the management arrangements for the new diamond synchrotron source. This project represents the most substantive investment by the UK Government in a new domestic large-scale research facility since the early 1970s. It is in an area where the CCLRC has built an international reputation – not only in the construction and operation of a synchrotron source (viz. the SRS at the CCLRC Daresbury Laboratory) but also in the continuing development of instrumentation. In this latter area, in several aspects, the UK is at the forefront of international developments. In recognition of this, the OST has asked the CCLRC to take on the responsibility of shareholder for the UK Government in the diamond Joint Venture Company, which is

being drawn up as the basis for partnership between the main funders for diamond. **It is the view of the CCLRC that in undertaking this shareholding role for Government there would be further benefit in it retaining Research Council status, not least because the line of accountability would remain as presently structured. We fully endorse this view.**

33. By retaining Research Council status for the CCLRC the direct line of accountability to the OST and to the Department of Trade and Industry (DTI), and also to Ministers and to Parliament would remain as distinct and visible as it is now.
34. **We note that the CCLRC is intending to develop its international, national and regional responsibilities.** The CCLRC has reported that, *“in terms of its international position, it must be able to undertake research that is at the cutting edge of world science and engineering. In this capacity it acts as an identifiable organisation that international scientists recognise and also it can offer strategic advice in international fora. In its national role, it seeks to provide facilities for any academic user from any organisation whose science and engineering are deemed to be of appropriate quality as judged by peer review. Again, it will offer strategic advice to the RCUK in collaboration with other leading UK experts. It also has a particular role to play in terms of its regional locations. For this aspect it conducts dialogue with the various regional development associations and other organisations and institutions within each locality to maximise the economic impact while being aware that its technology and strategic vision will also be of benefit to other regions. The CCLRC is aware that it must keep an appropriate balance in these issues remembering its core mission is to be a leading international laboratory on behalf of the UK”.*
35. The above developments represent changes, since the preparation of the Stage One report, to the context in which the Stage Two exercise has been conducted. The following chapters take these developments into account. They address, in turn: responses to the findings of the Stage One exercise (Chapter Two); the new strategic role within the UK science and engineering base that is planned for the CCLRC (Chapter Three); the challenge for the CCLRC of ‘improving performance’ as an organisation (Chapter Four); and the key principles for the future funding regime for the CCLRC (Chapter Five).

CHAPTER TWO: STAGE ONE FINDINGS

FINDING 1: The quality and relevance of science using national facilities

Stage One Recommendation:

“The UK should continue to invest in national large scale facilities”.

36. Evidence concerning future scientific trends points to a continuing need for access to large scale facilities, with the emergence of the life sciences as an increasing component of the user base. The increasing diversity of the user base has been effectively demonstrated in the use of synchrotron radiation sources. For neutron scattering there is emerging a range of techniques, including selective deuteration and studies under extreme conditions, that are extending the breadth of science that can benefit from their application. The scale of public investment in large scale facilities necessitates an overall usage strategy that seeks to deliver the best scientific return on investment achievable, consistent with a continuing high quality science demand.
37. Now, more often than not, the design and construction of large scale facilities requires international partnership. Such partnership ensures not only that design and build capabilities of the highest quality can be brought to bear on individual projects but also, and crucially, that the subsequent exploitation of the facilities can be undertaken in an atmosphere of strong international-level scientific endeavour. For the UK the advantages include the prospect that its scientists and engineers are able to work alongside the very best scientists and engineers in the world.
38. Prospects for international partnership need proper assessment, negotiation and co-ordination by the UK. There is a requirement for a more proactive approach. What might be termed the ‘chess board of opportunities’ for international partnerships in large scale facilities needs improved strategic management by the UK. In order to do this there is a need to improve understanding in the UK, at the highest levels of strategy and policy determination for science and engineering, of worldwide developments in new technologies and progress in engineering alongside emerging science requirements. Further, investment in large scale facilities should be preceded by an effective appraisal of whole life-time costs so that these can be factored into expenditure plans for the Science Budget.
39. Similarly, there is a need to contemplate a pattern of exploitation that transcends discipline boundaries. This emphasises the need to ensure that a multidisciplinary approach to exploitation of large scale facilities is adopted as a norm. But this is not the only requirement. Often the different combination of partners (that is individual countries) involved with any one facility is referred to as a ‘variable geometry’. Participants from different countries can be found across, say, neutron facilities, high

field magnet sources and also high power laser and synchrotron radiation facilities both within Europe and further afield. The range of countries participating in the use of any one facility can vary as can the level of participation of any country – this is true also for the UK. For example, some interests will involve a fixed share of construction and operating costs, while others will involve only a share in the building of individual instruments.

40. The pattern for international partnership that might confer distinct advantage for the UK in any period is likely to include a number of ‘variable geometries’. This is reflected in the present suite of large scale facilities that the UK has access to. It is also a feature of new facility proposals under development. Assessing the range of new opportunities, determining the possible benefits and outcomes and promoting UK requirements requires effective and efficient co-ordination and management, independent of scientific discipline.
41. **The UK needs to take more of an international lead in the strategic co-ordination of technical option appraisal and facility build, operation and development. The UK has a broad set of skills to contribute to large scale facility development and operation but there is a need to sustain a critical mass of capabilities in these areas. The research and development associated with future large scale facilities is necessarily longer term in perspective, and international in its organisation and management.** The UK needs to move to a position where its contributions to future developments in large scale facilities are made from a position of technical capability and leadership and where those contributions are made in a timely way so as to influence design, specification and scientific direction. History has shown the difficulties associated with seeking to join international projects late in the design schedule and requiring contribution in direct funding rather than in technical know-how.
42. **In managing the UK future investment in large scale facilities there is, therefore, a substantial activity involved and we believe that the CCLRC is centrally placed to undertake this role, informed and guided by the strategic considerations of the RCUK.**

FINDING 2: The need for a publicly-funded supplier

Stage One Recommendation:

“The UK’s national large scale facilities should continue to be publicly-funded”.

43. The case for public investment in science, engineering and technology has been well made by others and we shall not seek to repeat these arguments here. Immediately relevant publications include: the Stage One report of the CCLRC Quinquennial Review; the 1993 White Paper ‘*Realising our Potential*’, Cmnd 2250; and, the May

2000 White Paper ‘*Excellence and Opportunity. A Science and Innovation Policy for the 21st Century*’, Cmnd 4814.

44. Also relevant is the Institute of Physics/EPSRC report on ‘*International Perceptions of UK Research in Physics and Astronomy*’, 2001, which commented:

“The UK’s ongoing support for international facilities is a vital contribution to its scientific strength. It is important for the UK both to participate in developing and operating such facilities and to be able to have sufficient access to them for experimental research. The Central Laboratories should also continue to play an important role in major physics projects, both on and off-shore”.

45. While large scale national facilities in the UK should continue to be publicly funded there is a case for engaging, yet further, industrial interest in the research potential of those facilities. The CCLRC reported that it will continue to pursue the further development of this interest and expects that this will often also involve collaboration with university users of the facilities.
46. The arguments for the public funding of large scale facilities – as with other areas of science, engineering and technology – need regular exposure to a wider audience. The CCLRC has demonstrated that it is committed to playing its part more fully in the engagement of a wider public in the research and development that is conducted within its laboratories by initiating a successful programme aimed at raising public awareness, albeit on a relatively modest scale. To date, the CCLRC has received no direct funding for this activity and this issue is addressed further in Chapter Five.

FINDING 3: The CCLRC’s relationship with other Research Councils

Stage One Recommendation:

“The relationship between the Research Councils and CCLRC should be changed to an ownership model in which the Research Councils are jointly responsible for the facilities and their associated development programmes”.

47. Membership of the Council of the CCLRC has already been changed such that, from January 2002, five of the other Research Councils are represented at Chief Executive level. (The Economic and Social Research Council is not represented). This membership is complemented by the appointment of independent Council members, from academia, commerce and industry, who are able to add to the breadth of experience available within the Council.
48. The change in membership brings with it the real prospect of a dialogue between the CCLRC and the other Research Councils (and indeed between the Research Councils represented around the table). Strategic issues concerning the design, operation,

development and scientific direction, among others, for the large scale facilities, can be discussed openly and the supporting evidence evaluated jointly. This joint approach represents a considerable advance on the position which had previously obtained, where no ‘funders forum’ for discussion had existed.

49. This approach should have distinct advantages for the CCLRC in enabling it to reach a more deeply based understanding and strategic engagement with the other Research Councils on its programmes, in a manner that is managerially and administratively efficient and effective. At the same time, the closer working relationship between the CCLRC and the other Research Councils should enable the CCLRC’s expertise and knowledge directly to inform the decision making process.
50. The approach should also have advantages for the other Research Councils in that it will permit an open discussion of changing requirements for each Research Council to be taken into account in consideration of the operation of existing facilities and the appraisal of prospective new facility developments. Similarly, it is further expected that all Research Councils will benefit from a shared assessment of international developments that the Council of the CCLRC will be required to address.
51. **We believe that the new Council structure for the CCLRC should provide a forum in which all relevant Research Councils, jointly and with the independent members of the Council, can address the strategic advice on the UK portfolio of large scale facilities to be offered to the RCUK strategy group.**

FINDING 4: Access and paying for facilities

Stage One Recommendation:

“The current access procedures (for ISIS, SRS and CLF) should be replaced by a scheme which is common for all Research Councils and in which key aspects are peer review of the scientific merit of the proposed research and the marginal costs associated with the proposed experiments”.

52. The resourcing of facility operational costs is addressed in paragraphs 81 *et seq* below. This section therefore deals with future arrangements for access to the facilities.
53. One area of difficulty in recent years has been the diversity of facility access arrangements that has existed across the Research Councils. While each has been developed to meet particular requirements for competitive review, or to meet the needs of individual research communities, the resulting diversity has presented a confusing picture to the research communities overall. There is also evidence from respondents to the Stage One review that the access arrangements for national facilities have led to

some exodus of researchers and their programmes to overseas locations, which was not an intended outcome.

54. **We propose that a common facility access scheme for all Research Councils be adopted. This will, in this regard, improve and simplify the interface between the Research Councils and the research communities who use large scale facilities.**
55. **We propose that the scientific peer review of all facility access proposals be carried out by reviewers nominated by all the Research Councils, including the CCLRC, together with others nominated by international organisations.** The peer review advice will inform operational schedules managed by facility Directors. **We further propose that, with such suitable control on scientific quality in place, the three main facilities (ISIS, SRS and the CLF) be operated under a ‘free at the point of access’ model for all users.**
56. **We share the view of the CCLRC that a ‘free at the point of access’ model for facility access (for ISIS, SRS and the CLF) provides the best opportunity for:**
 - achieving a common access model across all Research Councils;
 - achieving consistency with the approach already in place for international users of the CCLRC facilities;
 - achieving consistency with the access models already in place for the ILL and ESRF, to which UK researchers have access; and
 - achieving parity in approach with the access mechanisms for other major international facilities which UK researchers are invited to use.
57. The ‘free at the point of access’ model anticipates, too, that the CCLRC will be able to develop access mechanisms that directly address the changing requirements of users sponsored by any of the Research Councils in a manner where the scientific quality of the experimental proposal is predominant. For example:
 - fast stream access for urgent structure determination;
 - feasibility experiments for new and existing users;
 - access for the training of research students and other new users;
 - the encouragement of consortia formation for block allocations;
 - high throughput access methods for high volume studies;
 - cross-facility scheduling, where appropriate; and
 - multifacility scheduling, as requirements emerge and the technology is developed.
58. It is anticipated that a ‘free at the point of access’ model for facility access (for ISIS, SRS and the CLF) would provide facility users with the following support for those experiments approved by peer review:

- one or more days access to a facility for setting up and running experiment(s) (for laser facilities experimental time is more normally allocated in week(s));
 - fully functional, well maintained and serviced sample environment and ancillary equipment in connection with the experiment (e.g. cryostats, temperature controllers, pressure equipment);
 - engineering and technical staff to assist with operation of the instrument and associated facilities;
 - scientific staff to assist with the design and running of experimental procedures and to train new users;
 - funding for minor consumable costs (currently up to £1500/experiment);
 - safety assessment of sample and experimental procedures;
 - safety training;
 - data acquisition and data analysis facilities;
 - support laboratories (e.g. chemical support laboratories, biological support laboratory facilities, dark rooms, sample characterisation facilities);
 - library support facilities;
 - funding for travel and subsistence costs and assistance with booking transport and accommodation requirements for the experimental visiting group; and
 - access to restaurant and other support services.
59. The introduction of a ‘free at the point of access’ model would result in the existing variety of access mechanisms, including the so-called ‘ticket’ mechanism, being replaced by the new arrangement. We are grateful to the Engineering and Physical Sciences Research Council (EPSRC), as a clear advocate of the ‘ticket’ mechanism, for being prepared to consider alternative arrangements. There were gains from the implementation of the ‘ticket’ mechanism that it will be important to retain. It will be as important to ensure that any undue constraints arising from this mechanism can be reversed.
60. The above provisions for a ‘free at the point of access’ arrangement apply principally for users from the UK academic research community sponsored by the Research Councils (or the UK Funding Councils for further and higher education). For third party access – such as from industry, the research charities and the international research communities - access to the facilities and the provision of support services would be subject to separate considerations. For these partners – as presently – it is expected that arrangements would be established for any appropriate costs to be met by the relevant research funders. It will be for the CCLRC, as now, to manage these arrangements separately and in accord with government accounting practice.

61. **Access by international researchers, not dependent on UK Research Council funding, should remain a characteristic of large-scale facilities funded through the Science Budget. Reaffirming this principle will serve to reaffirm the intention of the UK to remain a contributor to shared access in such facilities at the world level.** Access to other international facilities, that are ‘free at the point of access’, brings distinct advantage for the UK – but it also brings obligations in requiring some time on UK facilities to be provided to researchers from other countries that is also ‘free at the point of access’. Such international usage is normally at the few percentage points level (typically between, say, 3 and 10% in total) and does not in any way preclude the UK entering into agreements with individual international partners for more substantive cost sharing arrangements. These can take a number of different forms, including sharing the cost of new instrumentation or funding a share of operating costs or both, in return for access rights.

FINDING 5: Financial framework and processes

Stage One Recommendation:

“The financial and operational implications for CCLRC of adopting Limited Company status should be explored in Stage Two”.

62. **We have considered in some detail the implications of adopting limited company status and have reached the clear conclusion that the balance of advantage weighs unequivocally in favour of the CCLRC remaining a Non-Departmental Public Body (NDPB) and a Research Council.**
63. Our consideration has been rightly influenced by developments led by the OST (and referred to in the ‘Introduction’ to this report). These have included the creation of the RCUK strategy group, of which all seven Research Councils will be a member, and changes in the governance of the CCLRC.
64. In its 1993 Prior Options study [*Options for the future of the combined Daresbury and Rutherford Appleton Laboratories (DRAL). A Prior Options Study*, November 1993] KPMG Peat Marwick commented:

“A Company Limited by Guarantee is a legal entity established under the Companies Act. It is a suitable vehicle for the pursuit of clearly defined purposes, often for the wider public good, which are enshrined in its objects. It can make profits, but these are only to be used for further pursuing the objects of the organisation, not for distribution. When these objects are, for instance, clearly educational, the entity can also seek charitable status, which then enables the body to claim exemption from corporation tax. Members subscribe to the objects and provide the guarantee, which is normally a purely nominal sum. Such entities are generally leanly capitalised, since there is no such thing

as an equity stake, though they can borrow money if the income stream is one which attracts confidence. It is possible to set up subsidiaries which may trade, which generally preserve the charitable status so long as the profits from the trading subsidiary are covenanted to the parent company”.

65. The study concluded that the attractiveness of the Company Limited by Guarantee format depends on the circumstances of the research organisation. *“For those agencies identified as suited to privatisation, it looks a better option than trade sale since it preserves independence, avoids certain tax liabilities, yet introduces many of the disciplines which go with privatisation. For those where privatisation is not intended the status looks exposed. The gain is in management streamlining and internal flexibility, but there are very significant transfer issues. When government is looking markedly to decrease the dependence of the organisation on public funds, and the body needs to be more flexible and unconstrained by terms and conditions of staff, it remains a good option. Where this is not the case, the transitional costs and uncertainty are significant drawbacks. For DRAL, it appears to us to be unsuited to the purposes of independent status, on transitional cost, recurring cost (e.g. VAT) and timetable grounds”.*
66. Other aspects that have required consideration in reaching a view on the merit or otherwise of the Stage One recommendations, in particular that the CCLRC should be reconstituted as a Company Limited by Guarantee, have included:
- the level of change that would be required and the impact on the prosecution of research and development programmes, on the recruitment and retention of staff and the associated costs involved in transferring the public undertaking into a new enterprise such as a Company Limited by Guarantee;
 - the potential conflicts of interest, in terms of corporate governance, that might arise for individual members of the Council (in particular the Chief Executives of the other Research Councils) in seeking to balance the interests of a Company Limited by Guarantee with those of the Research Council, a Non Departmental Public Body, that they represent;
 - the absence of any distinct financial advantage (for example the CCLRC is already exempt from corporation tax and has charitable status for VAT) in the creation of a Company Limited by Guarantee for the whole undertaking;
 - the advantage to be gained from being able to separate out the commercially-based activities of the CCLRC, from the Science Budget-funded programmes, (for example in terms of ‘firewall’ and ‘focus’, see below) into a separate enterprise. A private sector company structure would provide an effective means for the exploitation of research outcomes for the CCLRC, and for the management of those activities and their associated costs that are not directly related to the core science and engineering programme;
 - the considerable uncertainty that must surround the medium to longer term consideration of whether that same private sector company structure could as effectively serve the fundamental science programmes undertaken at the CCLRC, by academic researchers from across the UK and internationally and also by companies at the pre-competitive stage;

- the support of fundamental science remains an internationally recognised attribute of public funding by Governments, in an environment that is free from the proper concerns of private sector enterprises for exclusivity, profitability, and independence of mission. Private sector motives have a distinct set of values when compared with public sector motives. While a number of public/private enterprises have sought to bridge the divide there is no significant body of evidence that such an approach would be the most appropriate vehicle for stewardship of some of the UK's premier fundamental science capabilities and assets;
- the success of the CCLRC to date has been a direct reflection of the contributions of its scientists and engineers who are able to support academic users in obtaining the best from research facilities. Under a Company Limited by Guarantee status there would remain questions about a number of aspects, which in the judgement of the CCLRC, would directly impact on the prospects for recruitment of scientists and engineers of the appropriate calibre. These include:
 - the stability of the enterprise (for example in terms of longer term custody);
 - reservations within the Machinery of Government about the requirement for primary legislation (for creating a Non-Departmental Public Body as a Company Limited by Guarantee);
 - the cost base (for example, the impact of charges for pensions cover);
 - lines of accountability (for example, between customers and the Board);
 - the prospect of precipitating an adverse change in VAT status (and so reducing the cost effectiveness of the Science Budget);
 - the outright transfer of land and buildings to a company (which would, unless that company were a charity or is otherwise given special exemption, incur an immediate liability to stamp duty at up to 4% on the value of the assets transferred);
 - the impact of the Transfer of Undertakings (Protection of Employment) Regulations (for example, on the terms and conditions for staff);
 - the threat that the interest of the other Research Councils might diminish if the assets were secured (for example, by transfer to the company).

67. **The conclusion reached is that, for its core business, the present status of the CCLRC should not change.** While it might be unusual for a QQR Stage Two exercise to opt for a different outcome to that advocated in Stage One, we recognise that the option of retaining Research Council status was always envisaged should the condition for Company Limited by Guarantee status not prove beneficial on further study. Coupled with the changing background described in Chapter One, we believe that the condition is satisfied by the above commentary.

68. **While it is proposed that the CCLRC retain the status of an NDPB and a Research Council for its core business we recognise that there are several areas where the ability to function via a company would have distinct advantages.** The Stage One

review did not make a sufficient distinction between the public science and commercial activities of the CCLRC. In Stage Two the CCLRC has sought to demonstrate to us the advantages to be gained in clearly separating the legitimate commercial and business management aspects of its enterprise from the public sector programmes.

69. The CCLRC has a broad range of activities that straddle scientific and engineering endeavour. At one extreme it represents leading-edge basic science focused around large physical facilities and critical mass groups that enable significant impact to be made on the world's scientific stage. It can act, too, as a portal for many UK scientists to access international facilities wherever they are located. In addition, it is of sufficient international stature to attract scientists and engineers of international repute from all around the world. Any change in status that compromised this position for the UK would be unacceptable and an irreversible change. However, the CCLRC has other activities and a body of intellectual property that should be exploited for the UK taxpayer, with particular attention to its regional locations.
70. **We note that the CCLRC has put in place plans to establish a holding company through which the advantages foreseen can be realised and financial protection (a 'firewall') afforded to the core CCLRC operations. We endorse these plans.** The holding company is intended to provide a locus for commercially based activity, distinct from the core Science Budget-funded programmes. It will enable the CCLRC to offer new forms of contractual relationship with a broader range of stakeholders. It will create new prospects for improving returns on the Science Budget. It will provide a genuine 'focus' for commercial activities and an increased awareness, across staff in all programmes, of the merit of exploitation as a value-added activity. The new holding company should, therefore, assist in maximising the returns to be gained from the public investment in research and development at the CCLRC.
71. In order to gain maximum advantage from this investment it is proposed that the CCLRC exploit its own intellectual property in two distinct ways, namely (a) the licensing of IP rights, and (b) the delivery of commercial services such as R&D, consultancy, hardware, software and access to facilities. A commercial strategy for a holding company is being developed whose initial focus and emphasis will be on (a), namely the licensing of IP rights to existing companies, start-ups and 'spin-ins'. In parallel, as part of a planned technology audit, the current and potential commercial services as defined in (b) will be reviewed. Those services that can be grouped into branded and commercially viable profit centres will be considered for transfer into the holding company.

FINDING 6: Preferred option for Stage Two

Stage One Recommendation:

“Stage Two should examine the issues associated with the implementation of a Strategic Ownership model, in which CCLRC is reconstituted as a Limited Company

under the joint ownership of the grant awarding Research Councils. In particular, the implications for the status of CCLRC and its accountability to Ministers and to Parliament will need to be explored”.

72. The proposal that the CCLRC be reconstituted as a Company Limited by Guarantee has been addressed in the previous section. This section is therefore restricted to consideration of the concept of ‘strategic ownership’.
73. The idea of strategic ownership needs also to accommodate the changing pattern of scientific use of large-scale facilities. As the size and disciplinary diversity of the scientific user community have increased, so these have impacted on the scientific expertise and budgets of the current stewards of the individual facilities. While the three UK-based large scale facilities (ISIS, SRS and the CLF) are currently funded by contributions from the Research Councils there exists no common forum in which the stewardship, governance, budgeting or the impact of the changing pattern of scientific use can be addressed in a coherent manner. For the international neutron and synchrotron facilities in Grenoble (the Institut Laue Langevin and the European Synchrotron Radiation Facility), in which the UK is a partner, there has been a similar change in the pattern of scientific use over time. UK participation in these latter facilities is currently managed through the EPSRC but the diversity of the user community now extends beyond the scientific remit of that Research Council.
74. This change in use is similar to that found within the USA. In 1999, the National Research Council reviewed interagency cooperation in the management of federal research facilities (see *‘Cooperative Stewardship: managing the nation’s multidisciplinary user facilities for research with synchrotron radiation, neutrons and high magnetic fields’*, National Academy Press, 1999). The review examined the stewardship of the nation’s, then, six synchrotron light sources, five neutron sources and high field magnet laboratory (current operating costs \$300M/year, with a current replacement value of \$5Bn).
75. One of the findings of the review was that:

“ ...increases in the costs, management complexity, and diversity and number of users have created a need for a more coherent and better articulated strategy for managing these facilities”.
76. It was recommended that:

“To ensure continued scientific and technological excellence and innovation at multidisciplinary user research facilities, US funding agencies should adopt a cooperative stewardship model for managing the facilities”.
77. The review recommended the development of a ‘cooperative stewardship’ approach to the management and continuing development of large-scale facilities. The elements of the cooperative stewardship model proposed are repeated here simply to illustrate that other countries are seeking to address similar issues to the UK in this area, and were as follows:

- *“responsibility for design, construction, operation, maintenance, and upgrading of each facility core should rest with a single clearly identified federal agency – the ‘steward’;*
- *the steward’s budget should contain sufficient funds for design, construction, maintenance, operation, and upgrading of the facility core;*
- *the steward should engage the partners – other agencies, industry, and private institutions – in the planning, design, construction, support, and funding of the experimental stations and other subfacilities. The steward can also function as a partner in, for example, supporting experimental units or joining with others to form user groups;*
- *the steward should support a robust in-house basic scientific research program. This program should be of sufficient magnitude and diversity to ensure that the steward’s mission is addressed and that external users have adequate quality and quantity of collaboration and technical support in their fields;*
- *the steward should support in-house scientific research to advance the science and technology required to produce high-quality photon and neutron beams and high magnetic fields”.*

78. **The question of how best to prosecute the concept of strategic ownership for large scale neutron and photon facilities in the UK has been the subject of discussion between the CCLRC and the Research Councils during Stage Two. In our view, the key to achieving a successful outcome for these discussions has been the recognition that the present arrangements are less than optimal.** Each of the stakeholders has been required, therefore, to consider changes both in their own approach and in the overall arrangements for management of the facilities involved. We very much appreciate the time and effort devoted by all parties to these discussions. As the outcome of the Stage One exercise revealed, it has previously been difficult to identify a single approach in which all stakeholders can have confidence. It is, therefore, very much to the credit of those participating in the Stage Two exercise that the prospect of a common approach is now a realisable goal. In our view this outcome bodes well for the future.

79. In addressing models for the future operation and development of the large scale facilities the following observations have informed the discussions:

- the cost of construction of the large scale neutron and photon facilities represents a considerable legacy of public investment for which all the stakeholders have a duty to ensure that the optimal return for science is obtained, as originally envisaged;
- in as much as these facilities primarily serve the interests of the other Research Councils, in enabling them to pursue aspects of their scientific missions, the facilities can be said to be ‘owned’ by them;
- it is, therefore, essential that the other Research Councils are able directly to influence the level of operation of these facilities and their scientific capabilities, for example through the associated instrumentation and facility support programmes;

- while access to the facilities by international researchers remains an instrument of UK science and technology policy (not least as part of the international exchange of limited time on large scale facilities – see paragraph 61 above) then this requirement needs also to be managed;
 - it is expected that other international access - and other third party access, for example by industry – will also result, as at present, from agreements entered into for the sharing of operational and/or development costs;
 - there should be a single authority directly accountable for the management and delivery of effective and efficient operation of the large scale facilities;
 - the management of large scale facilities is a high fixed-cost operation and the planning for operation and continuing development needs to be put onto a firmer basis for the medium to long term;
 - the ability in-year and, in the short-term, between years to adjust the cost base to accommodate significant changes in operational levels is limited.
80. We have given consideration to models for the planning and funding of facility operations and models for funding the ongoing development of facilities.

Facility Operations

81. The process that needs to be put in place for the future management of facility operations is one that is sustainable in the longer term and as such must ensure that the other Research Councils remain the determinants of the level of Science Budget funding assigned. By this means the other Research Councils will be able to exercise their duty of ‘strategic ownership’ of the facilities and influence the level of operation and scientific direction for each facility. Equally, it is vital that the individual Research Councils, the RCUK and the OST have a full appreciation of the costs involved in operating large-scale facilities. Stage One recommended that *“the relationship should be changed to an ownership model in which the Research Councils are jointly responsible for the facilities and their associated development programmes”* and added *“This model has the clear commitment by the Research Councils to meet the planned funding needs of CCLRC based on scrutiny of strategic and operating plans”*.
82. It should be the aim of the Research Councils and the OST to ensure that there is sufficient guidance provided for the CCLRC to enable it better to plan operational levels with a greater degree of confidence than at present. This should enable agreement to be reached sufficiently well ahead of the commencement of the year of operations, so as to ensure efficient and effective planning by the facility operators. This discipline does not happen at present and this has been the cause of much concern.

83. We further propose, therefore, that a key feature of the future arrangements should be planning for the medium to longer term in order to meet the needs of the facility operators and the users of the facilities for the planning of their programmes. In turn it should be the acceptance of the plan for operations, agreed by the stakeholders that should secure the necessary provision of funds year on year. The proposed RCUK will, in future, have a key role in providing guidance and strategic direction on facility operations for the medium to longer term.
84. In our view, the OST and the Research Councils can have assurance from the past record of the CCLRC that the facility operations will be conducted with skill and effectiveness. The performance under the existing Service Level Agreements between the CCLRC and the Research Councils has demonstrated consistent high levels of satisfaction from funders and users. We would expect this to continue. We would also expect the CCLRC to keep the efficiency of its operations under regular review and have been assured by the actions referred to in Chapter Four that this will be a high priority for the CCLRC. There is evidence to show that the UK has a successful record of gaining significant returns for science from the effective operation of large-scale facilities. The opportunity to be taken now is to sustain this and to develop a more strategic approach to operational planning and continuing development of the facility portfolio.
85. We have set out in Annex 1 to this report a description of the models that have been the subject of scrutiny during Stage Two. **Our preference is for Model One. We consider that the following steps should constitute an outline of the new arrangements for the management and funding of facility operations:**
- that the CCLRC, together with the other Research Councils, develop a strategic appraisal of the facility access required by their research communities over the medium term – that is, say, a three to five year period;
 - that the requirements be kept under regular review so as to provide the CCLRC with the ability to develop medium term planning for operations;
 - that the CCLRC be required to draw the agreed and costed requirements of the Research Councils together - along with any other requirements for international and other third party access – and to present a total plan for medium term operations through the RCUK to the OST.
86. The final step should be the process that secures the necessary funding for operations (for ISIS, SRS and the CLF). **To provide for the close and continuing engagement of the other Research Councils in the usage of the large-scale facilities we recommend that the CCLRC jointly agrees with them a series of metrics for the quality of science undertaken. We recommend also that the CCLRC agrees jointly with the other Research Councils a series of performance measures and targets designed to demonstrate the value for money achieved through efficient and effective operations management.**

Facility Development

87. As technology develops and provides new options for addressing current scientific needs, and as science identifies new horizons for enquiry, so the continuing development of facilities is necessarily a permanent feature of their life cycle.
88. Because the development of facility instrumentation, for example, is intimately related to the scientific exploitation of a facility there are good reasons why the control of such development might remain under the direct control of the other Research Councils. On the other hand, as evidenced by the approach taken for example in the USA (see above) and at the ILL and ESRF in Grenoble, funding can also be provided direct to facility operators for them to determine and prioritise future developments. Both models appear to work satisfactorily. Again, for the UK, the thrust of the Stage One recommendation was that *“the relationship should be changed to an ownership model in which the Research Councils are jointly responsible for the facilities and their associated development programmes”*.
89. In the discussions between stakeholders during Stage Two, both options for the provision of development funding and the determination of developments have been considered. A commentary is set out in Annex 2 to this report.
90. **Whichever option is chosen for managing the future development of the facilities, the essential features of the arrangement should be:**
 - for the CCLRC to draw up, in consultation with all stakeholders, a road-map for the potential development of each facility, taking into account developments at other facilities overseas, technical options, opportunities for international partnerships and scientific requirements;
 - for the RCUK to consider the road-map proposals and to give strategic guidance on future development of the facilities;
 - for academic researchers and, as appropriate, the CCLRC facility staff to prepare and submit for peer review proposals for individual developments of a value, say, of up to £10M;
 - for major facility development proposals (that is, say, above an individual cost £10M), a case to be prepared by the CCLRC, following consultation with stakeholders, for submission as part of the Government’s spending reviews;
 - for replacement or next generation facility proposals, a case to be developed by the CCLRC, following consultation with stakeholders, for submission as part of the Government’s spending reviews; and
 - where appropriate, development proposals will need to be prepared in accord with the Office of Government Commerce ‘Gateway’ process for large publicly-funded projects.

91. **In our view, it will be necessary for the CCLRC to keep under review the pattern of facility development arising from these arrangements.** The roadmaps which, we have advocated, should be established for each facility will provide a reference framework for individual development proposals. It will be for the CCLRC to keep this framework under review taking account, among others, of developments at other leading edge facilities around the world. It is essential that UK researchers have access to best-in-class neutron, synchrotron and laser facilities for their research. We leave it for others to determine the precise mechanisms to be put in place for the facility development funding option chosen.

CHAPTER THREE: THE NEW STRATEGIC ROLE FOR THE CCLRC

Stage One Recommendation

“ CCLRC should seek to fulfil a more strategic role in the provision of access to leading edge, large scale, facilities for UK researchers. Investment in new facilities should be based on long term requirements agreed by all the different communities”.

[Extract from the Executive Summary of the Stage One Report]

92. **We strongly support the Stage One recommendation that the CCLRC should seek to fulfil a more strategic role in the provision of access to leading edge, large scale, facilities (for neutrons, synchrotron radiation and high power lasers) for UK researchers.** There has, for some time, existed a real need in the UK to co-ordinate the strategic assessment of requirements for access to large-scale facilities by UK researchers. There is an opportunity through the current Quinquennial Reviews of the CCLRC and of the other Research Councils to reaffirm the responsibility for delivering such assessments.
93. The CCLRC recognises that it will be required to work closely with the other Research Councils in establishing scientific requirements, in assessing technical solutions, in appraising opportunities for international collaboration, in undertaking cost benefit analyses and in presenting strategic considerations. This is consistent with the methodologies it is proposed shall be adopted by the RCUK and also with those advised by the Office of Government Commerce ‘Gateway’ process for large scale project management.
94. Having the Chief Executives of the other Research Councils as members of the Council will considerably assist the CCLRC in preparing and presenting the outcomes of such strategic appraisals. As a consequence, advice on the UK requirements for large-scale facilities can be prepared for consideration by the RCUK in a consistent manner, with the close engagement of those other Research Councils.
95. It would, of course, be possible to contemplate that some other organisation - for example one or more of the other Research Councils - be given the new strategic role. Clearly, it would be difficult to give any one of the other Research Councils a strategic role that drew on a broader remit for science and engineering than that of their natural constituency. Notwithstanding this point, however, if responsibility for different facilities were to be placed with different Research Councils then the advantages to be gained from having responsibility placed with a single entity would be lost – not least at a time when interdisciplinary research requiring the use of several facilities to attack a common problem in science is becoming increasingly relevant and important.
96. **Placing the new strategic role with the CCLRC - the national focus for large scale facilities - would confer a number of advantages for the UK.** The CCLRC:

- is the natural conduit within the UK for national and international collaboration in the underpinning technologies for large scale facilities;
 - has an extensive range of contacts with laboratories across the world that are concerned with the development of concepts, project management, construction, staffing, operation, continuing development and decommissioning of large scale facilities;
 - can work to promote improved international discussion of, for example, the next generation of large scale facilities;
 - retains key science, engineering and technology expertise and capabilities that can be brought to bear on the assessment of technical options alongside science requirements;
 - is, as a consequence, the national asset, recognised internationally, that can provide the essential focus in the UK for advice on large scale facilities.
97. In addition, the CCLRC provides a locus for developing people with the necessary skills and background experience able to represent the UK in management of the international large scale facility programme. The Quinquennial Review of the grant-awarding Research Councils (December 2001) drew attention to the need at the international level for the UK *“not only to follow through on its participation in international partnerships but, in particular, to position itself so as to grasp new opportunities for partnerships overseas wherever these offer benefits for the UK”*. The CCLRC is well placed to take on this responsibility for large-scale facilities. It is working with the Foreign and Commonwealth Office to establish a series of secondments to British Embassies overseas to provide for improved government-level contacts over research infrastructures and large-scale facility developments. This work will serve also to strengthen the capabilities of the CCLRC staff involved and the depth of experience available to the CCLRC in fulfilling its new strategic role. It will also complement the technical capabilities and level of international inter-laboratory collaboration and partnership that already exists within the CCLRC.
98. In outline, therefore, **we propose that the CCLRC be required to develop strategic options for the UK portfolio of large-scale facilities (for neutrons, synchrotron radiation and high power lasers) for consideration by the RCUK. It will be for the RCUK to determine the guidance and strategic direction to be given to the CCLRC on the continuing operation and development of the facilities. In turn, the CCLRC will be responsible for implementing the agreed UK strategy.**
99. **Against this background, it is further proposed that responsibility for managing the UK subscription to the European Synchrotron Radiation Facility (ESRF) and to the Institut Laue Langevin (ILL) be transferred to the CCLRC - alongside that for diamond and the UK contribution to the European Spallation Source international R&D programme – under the strategic direction of the RCUK.** The outcome of this would be that the CCLRC would be in a better position to co-ordinate the UK strategic programme for investment in synchrotron sources (the SRS, ESRF, diamond and the proposed Fourth Generation Light Source) and in the neutron programme (ISIS, ILL, and the proposed third generation neutron source, ESS). This responsibility would also then be placed with the same organisation that was responsible

for developing underpinning research and development programmes for future generation projects. **The result would be to create a crucially important focus for strategy for UK participation in present facilities that could both draw on and influence the development of the next generation facilities. We strongly recommend this approach be adopted.**

100. At present, responsibility for the management of the UK subscriptions to the ILL and ESRF rests with the EPSRC. The diversity of the user base for these facilities now extends beyond that of the EPSRC and is much more closely aligned with the diversity of the user base for the CCLRC neutron and synchrotron radiation facilities. Additionally, there is a growing interest in integrated studies using both neutron scattering and X-ray techniques. Where it is appropriate to encourage and support such studies this will be better coordinated – at both the national and international levels – through the technical and strategic management of the CCLRC as the single responsible organisation for promoting UK interests.
101. For the international facilities, as for the national facilities, it would be for the CCLRC to propose strategies for UK participation for consideration by the RCUK. Again, it would be for the RCUK to offer guidance and strategic direction on UK involvement in the facilities and, acting on the advice of the RCUK, for the CCLRC to implement the agreed strategy working with the appropriate international partners. The thrust of the new arrangements should be to achieve optimum use of the Science Budget funding across all the large-scale facilities.
102. **There is merit in proceeding with the proposed transfer of responsibilities soon. Discussions within Europe are already underway on the coordinated development of neutron facilities, including the ILL Millennium Programme. In addition, discussions are similarly underway on the next generation of neutron and photon facilities. The CCLRC should be at the heart of these discussions and plans, on behalf of the RCUK.**
103. There would, of course, be challenges for the CCLRC in successfully delivering its new strategic role that were touched on in the Stage One review. The Stage One report said that: “*Stage Two should examine how this strategic role can be implemented, such that (CLRC) is not compromised by (its) role as a facilities operator*”.
104. Within the CCLRC, the drawing together and provision of strategic advice on large-scale facilities should be carried out separately from the day-to-day management and operation of its own facilities. The determination of strategy will draw on a wide constituency of stakeholders, both nationally and internationally, and including the current and prospective users of facilities. It will draw also on scientific requirements identified by the other Research Councils. It will take account of the outcomes of in-house research programmes designed to elucidate and identify technology roadmaps. It will, in turn, rely on independent inputs on technical options to meet the scientific requirements. All of these contributions will need to be formulated by the CCLRC into advice on future strategic options for presentation to the RCUK.
105. **It is essential that the new regime for strategic advice on the future UK large-scale facility portfolio that is being put in place to serve the OST and the RCUK is objective, open and verifiable. Each time that the CCLRC puts forward advice it must be required to demonstrate that these conditions have been met. We believe**

that the organisational arrangements that the CCLRC is putting in place mean that this will be successfully managed by the CCLRC.

106. **The advantages that can be contemplated for the Science Budget in bringing together the above range of activities under the responsibility of a single body such as the CCLRC - effectively for the first time within the UK - are in our view considerable.** The CCLRC would provide the sought-for focus, within the Research Councils, for large scale facilities (for neutrons, synchrotron radiation and high power lasers) alongside a wider set of science, technology and engineering capabilities – a position that can be expected to have national and international impacts and benefits.
107. The national impact will arise, for example, through the CCLRC working with those users who require support in securing access to the appropriate facilities for their experiments (this is expected to be especially beneficial in the life sciences). The CCLRC can present a common interface for access to UK-based facilities and a portal to other facilities where this is needed.
108. The international impact will arise, for example, through the CCLRC being able to argue from a position of technical, and in future strategic, strength for better co-ordination across Europe and elsewhere on standards, technical developments and complementarity in instrumentation between different facilities.
109. There are also wider strategic issues involved for the CCLRC. Its advice to the other Research Councils, the OST and the RCUK will need to be developed from a continuing background of strong international links and key technology competencies as well as continued experience in the operation and scientific exploitation of large scale facilities. In this way its advice will be a valuable national asset.
110. **Against this background, we support proposals by the CCLRC to establish, for example programme links with the Defence Science and Technology Laboratory, and to examine the potential for improved links with Research Council Institutes and local, regional and national links with Higher Education Institutions.**
111. **Similarly, the range of strategic networks, cooperations and collaborations that the CCLRC has with international laboratories are a long established feature. There is a need for the CCLRC to retain the independence and ability to enter into appropriate agreements with such organisations.**
112. **Networks and collaborations with industry - not least those involving the development of core capabilities in key technologies (accelerator technologies, instrumentation and e-Science for example) – are also an important aspect that can help inform the CCLRC advice.** The CCLRC is well placed to develop further such links with industry, for the benefit of the UK science and engineering base.

CHAPTER FOUR: IMPROVING ORGANISATIONAL PERFORMANCE

113. Reference has been made in Chapter Two and Chapter Three to the challenge of improving performance in the management of the UK large-scale facility portfolio, funded through the Science Budget, by the development of a strategic partnership between the relevant Research Councils and the OST. This chapter addresses the challenge for the CCLRC in improving its performance as an organisation.
114. Consistent with its new role and responsibilities, the CCLRC has reported that it will work with its new Council to examine ways in which its future performance can be enhanced and to implement the necessary change management programmes. In examining the way forward, the CCLRC plans to draw on its extensive range of international contacts to learn from the ways in which other organisations tackle similar problems and to draw on the very best solutions. The CCLRC intends that in several areas of its business it shall seek appropriate benchmarked accreditation. Immediate attention will focus on the following areas.

(i) **Policy advice.** The CCLRC will work to improve the range of inputs to the development of policy and planning. The CCLRC has indicated that the immediate requirements are two-fold:

- the establishment of a science advisory body, including international membership, to provide independent advice on the CCLRC research programme;
- a high level strategy group, to provide advice on the longer term future for the CCLRC Daresbury Laboratory.

(ii) **Evaluation.** An evaluation framework will be developed that will encompass all CCLRC activities. The framework is intended to include: (a) the evaluation of the CCLRC organisation, management and staffing; (b) research undertaken by external scientists using the CCLRC facilities and sponsored by other agencies; (c) research undertaken by the CCLRC in-house scientists and engineers; and (d) international benchmarking of the CCLRC operation of the large scale facilities for neutron scattering, synchrotron radiation and high power lasers. Progress in implementing the new framework, together with outcomes and outputs, will be reported through the annual CCLRC Operating Report.

(iii) **Staff Development.** The continued development of staff, to support recruitment and retention and to ensure that the right skills are available to meet future requirements, will be a crucial factor in determining the success of the CCLRC in the competitive market for key skills. A review of skill requirements, alongside future anticipated programme changes, is to be undertaken. The CCLRC has achieved the *Investors in People* standard, demonstrating its commitment to staff learning and development and effective communications, and intends to build on this foundation.

The CCLRC will put in place staff development plans for senior and middle management levels. This will include the widespread introduction of a management

development programme entitled “*The Management Excellence Initiative*”. The initial programme has been developed and pilot trials completed and evaluation of these is underway. The programme will be based on twelve key management competencies – achievement focus, communication, continuous improvement, corporateness, developing new opportunities, developing people, leadership, managing performance, planning and organising, problem solving and decision making, responsibility and integrity, and teamwork. Participation will be at one of two levels – the ‘*Foundations for Management Excellence*’ and the ‘*Management Excellence Programme*’ - and will be for all of the CCLRC line managers at the appropriate stage of their careers.

Further staff development initiatives put in place within the past six months include a more structured programme of secondments for selected staff to industry, other national and international laboratories, other Research Councils and to universities. These secondments will be designed to strengthen the range of skills available to the CCLRC and to promote closer working with key stakeholders.

The CCLRC will seek to promote actively the work of its staff to ensure that both the work and the staff involved receive due recognition, including in terms of national and international prizes and awards in science and engineering.

(iv) **Restructuring.** The degree of change planned for the CCLRC is considerable. The need for change derives from the outcome of the Quinquennial Review, from new project approvals that will result in substantial inward investment in the near to medium term, and from changes that will inevitably arise from the closure of other programmes. In order to manage this level of change successfully it will be necessary to increase the flexibility of management and staffing structures alongside organisation and business process development. There is within the CCLRC a considerable enthusiasm among the staff for change and a strong belief that the necessary goals are attainable. The extent to which such restructuring can be achieved in a timely and cost-effective way will depend on the scope within the funding made available to the CCLRC in future.

(v) **In-House Research.** The CCLRC intends to strengthen its capabilities in key areas of technology, to develop centres of critical mass in areas vital to the future of the UK science and engineering base and which draw uniquely on the contributions that the CCLRC can make. Areas currently under development in this way include accelerator technologies, instrumentation and technology support for e-Science applications. In science, the intention is to develop research networks with academia and with industry so as to add value to the research undertaken in these sectors through the work of the CCLRC and its in-house research staff. In-house research programmes will be subject to inclusion within the evaluation framework that is to be developed for the CCLRC (see (ii) above).

(vi) **Full cost review.** To ensure that as much as possible of the CCLRC funding is directed towards science and technology outputs a full review of costs will be undertaken. This will include a review of the most effective control of indirect costs and the promotion of synergy across a changing portfolio of programmes – in a drive to identify inefficient operations and to seek improvements in efficiency. The goal will be to ensure that programme priorities influence the distribution of costs and that the most cost effective means of delivery are achieved. The review is expected to be completed during 2002.

(vii) **The management of the asset base.** A more detailed plan for the effective management of fixed assets will be put in place. For example, so as to provide up-to-date, flexible accommodation that is fit for purpose and complies with changes in legislation. A planned schedule of maintenance, upgrading and replacement of the existing building stock is required to support changes in the science and engineering programmes. Protecting the value of these assets at the CCLRC is as vital as maintaining the large-scale facilities contained within them. The CCLRC will look to work with key stakeholders in the development of the site and its capabilities – for example, to strengthen the scientific culture and environment within all three of the laboratories and to provide facilities to support a public engagement in science programme.

(viii) **Site Management.** Opportunities for more effective and economic management of site infrastructure and the associated expenditure will be explored. The strategy for pursuing improvements in site management will be set out in the CCLRC Strategic Plan.

(ix) **Hosting of new programmes.** The diamond synchrotron radiation source project constitutes the major new programme that the CCLRC is currently planning to host on its sites, though it is not the only one. Clear leadership, strong management and effective co-working practices will be required to realise the benefits from hosting new programmes. The CCLRC will be working with the new diamond Project Management Team to integrate successfully the key business systems and science programmes and to identify appropriate cost bases and service levels for accommodating the diamond project requirements. There will be high-level integration of the management teams. The Chief Executive of the diamond joint venture took up his post in October 2001 and the process of integration within the CCLRC has begun. Both sides are seeking real benefits for science, for management and for operating costs from the new association.

115. The CCLRC recognises that these plans represent a substantial and continuing programme of change that will require a high quality of management and leadership. To support the achievement of these aims a new Corporate Management Board has been put in place and continuing attention will be given to the need to bring in fresh ideas and new skills to assist the change process.
116. The plans for improving organisational performance should be subject to regular scrutiny by the Council of the CCLRC. The strategies should be set out in the CCLRC Strategic Plan and progress against targets reported through the annual CCLRC Operating Plan.

CHAPTER FIVE: TOWARDS A NEW FUNDING REGIME

117. We have made a number of recommendations that we recognise will have an impact, among others, on the way in which funding is made available to the CCLRC in the future. In this chapter we rehearse what we believe to be the principal finance issues that require consideration. We leave it for others to determine the precise mechanisms by which these changes could be implemented.

118. **We recommend that consideration is given to the following:**

(i) *Funding for operational costs for large scale facilities, currently - the ISIS spallation neutron source, the Synchrotron Radiation Source and the Central Laser Facility*

- we have recommended that the other Research Councils, together with the CCLRC, establish a medium term plan for operating requirements for these facilities. This should provide a greater measure of certainty to enable the operations of the facilities to be planned by the CCLRC with confidence;
- we have proposed that the CCLRC shall be responsible for drawing up the operating plan for each facility taking into account all categories of use (national and international). Once this plan has been considered by the RCUK we would expect that this would secure the necessary provision of funding. We recommend that such funding be provided direct to the CCLRC, as an allocation for a spending review period;
- this arrangement would enable the CCLRC to host international programmes, approved by the RCUK and the other Research Councils, without having to establish separate funding lines;
- the proposed evaluation framework for the CCLRC would include the benchmarking of the CCLRC facility operational costs alongside those of other similar international facilities. By this means the cost of operations for the UK facilities could be monitored.

(ii) *Funding to maintain the leading edge technical capabilities of the CCLRC laboratories*

- provision for the timely refurbishment and updating of key laboratory equipment and related infrastructure is essential to maintaining the value of the national assets vested in the CCLRC;

- provision for the continuing development of the large scale facilities (neutron, synchrotron radiation and high power lasers) is essential to the support of internationally competitive science programmes of facility users;
- provision to enable key technologies and competencies to continue to be developed at the CCLRC is essential to support development of the next generation of large scale facilities, other science and engineering support programmes and continuing collaborations with academic researchers and others.

(iii) *Funding for the support of the new role for the CCLRC in the co-ordination of strategic advice, within its fields of competence, on the UK portfolio of large- scale facilities, together with management of the international programme.*

- provision for the management costs associated with the co-ordination of strategic advice for the other Research Councils, the OST and the RCUK;
- provision for the management costs associated with the CCLRC role of shareholder in the diamond joint venture company on behalf of the UK Government;
- provision for the UK subscriptions to the ILL and the ESRF international facilities it is proposed that the CCLRC should take responsibility for, and provision for the associated management costs.

(iv) *Funding for a new public engagement programme.*

- the third Objective of the CCLRC's Royal Charter places upon it a duty to foster public awareness in the fields of activity in which it is engaged;
- the CCLRC currently receives no funds for activities that would contribute to meeting this objective. Until now, it has performed a modest, yet well-received, programme of public awareness activities as a charge against the organisation's indirect costs but this is not sustainable in the medium to long term;
- with direct funding from the OST a programme of public engagement activities could be established, in cooperation with others, including educational support activities (support for teachers and for the national curriculum), career support activities and public access to science and engineering.

(v) *Funding for the support infrastructure costs for other Science Budget funded programmes*

- the many current separate Service Level Agreements and contracts, often involving the same funder, each include provision for elements of the CCLRC fixed costs. The CCLRC has argued that the variety of ways and means by

which these essential funds flow to the CCLRC constrain its ability to manage costs economically and efficiently;

- simply with those Service Level Agreements with bodies funded by the Science Budget, a delay in reaching agreement on the level of service required and the costs involved can mean that not all of the CCLRC's fixed costs may be met in any one year. This is exemplified by the fact that reductions in the volume of business placed with the CCLRC by any one customer has a marginal impact on the remaining customers. However, it would require all customers to agree their forward programme at the same time, or sufficiently well ahead of an operating period, if the CCLRC were to avoid either making an undue surplus or failing to cover its actual fixed costs. This discipline does not exist at present;
- funding for some 35% of the CCLRC support infrastructure costs would be provided through the direct funding of large scale facility operations;
- providing the funding to meet all of the fixed costs attributable to the Science Budget funded programmes direct could enable the CCLRC to manage more effectively and economically. This would include ensuring synergy with other current customers placing business with the CCLRC and others expected to locate at the laboratory sites in future;
- the CCLRC has argued that a direct funding arrangement would more readily enable it to consider other methods of management for these costs, including outsourcing, and that it would give much greater freedom in the implementation of 'spend to save' investment proposals, including required restructuring;
- the CCLRC would expect to work closely with other landholders adjacent to its sites in seeking to develop an effective and economic plan for site support and development – including evaluation of the extent to which the private sector might be involved. For example, at the Rutherford Appleton Laboratory this would involve the United Kingdom Atomic Energy Authority (UKAEA) and the National Radiological Protection Board (NRPB) as other public sector stakeholders;
- we believe that the funding of the CCLRC support infrastructure costs is worthy of further consideration by others. To assist we have identified different models in Annex 3 to this report.

119. In addition, we note from the CCLRC that:

- funding for the 'project costs' for other Science Budget funded programmes would remain the subject of Service Level Agreements and/or research grant awards allocated under terms agreed with the other Research Councils and, where appropriate, via competitive peer review;
- where appropriate, the CCLRC will continue to seek funding from other sources, for example from industry, other Government Departments and from international

sources, to provide additional value for the investments made by the Science Budget;

- a limited company will be established to provide for the exploitation of the CCLRC's intellectual property, know-how and service support.

LARGE SCALE FACILITIES (ISIS, SRS, CLF): models for the management and funding of operations

Model One:

- 3-5 year operations plan drawn together by the CCLRC in consultation with all stakeholders (national and international), and kept under review every 2-3 years;
- the Council of the CCLRC to approve the operating plan proposals and the RCUK to provide strategic guidance on facility operations;
- the CCLRC to be funded directly by the OST for Science Budget-funded operations.
- third party access (e.g. international and industry) funded by appropriate sponsor, and managed separately by the CCLRC.

Model Two:

- each Research Council prepares a 3-5 year medium term plan of operating requirements, which is kept under review every 2-3 years;
- the CCLRC draws together a total operating plan, taking into account third party use (e.g. international and industry);
- the Council of the CCLRC to approve the operating plan proposals and the RCUK to provide strategic guidance on facility operations;
- each Research Council to fund the CCLRC for their operation requirements;
- third party access (e.g. international and industry) funded by appropriate sponsor, and managed separately by the CCLRC.

Model Three:

- ‘core’ operations costs (fixed costs) provided by the other Research Councils, or the OST, against a medium term plan for operations;
- ‘plus’ operations costs (experimental costs) provided by the Research Councils in response to demand year on year;
- third party access (e.g. international and industry) funded by appropriate sponsor, and managed separately by the CCLRC.

LARGE SCALE FACILITIES (ISIS, SRS, CLF): options for the management and funding of development

OPTION A:

- (i) the CCLRC prepares a road-map for each facility in consultation with all stakeholders;
- (ii) the CCLRC prepares, for consideration by the RCUK a costed development plan for the medium term;
- (iii) the OST and/or the other Research Councils agree the Science Budget funding for the medium term development plan;
- (iv) the CCLRC implements a series of development projects within the total available funding (i.e. Science Budget and third party funding);
- (v) the road-map and medium term development plan for each facility is kept under regular review by the CCLRC and the RCUK.

Commentary

- establishing the road-map would be an inclusive process for all stakeholders (including users), that could be subject to international review;
- would provide for a single stream of Science Budget funding, facilitating medium term planning by the CCLRC;
- could enable the CCLRC to manage better the integration and leverage of third party funding;
- would enable the CCLRC to control the pace and priority for development, consistent with scientific needs and operational requirements;
- the development plan could accommodate the funding of multiple copies of some developments (e.g. sample environments and detectors);
- could, perhaps, more readily accommodate multidisciplinary developments;
- there would be no opportunity directly to tension individual ‘facility development projects’ against other demands on Science Budget funding in open competition;
- could be seen by non-facility users as a ‘privileged route’ for facility development.

OPTION B:

- (i) the CCLRC prepares a road map of development opportunities for the medium term for each facility, in consultation with all stakeholders;
- (ii) academic researchers and/or the CCLRC staff prepare science and business cases for individual facility developments for submission to the other Research Councils for their consideration;
- (iii) the other Research Councils decide which developments to fund;
- (iv) the CCLRC manages the coordination of Research Council funding for development with third party funding;
- (v) the road-map for each facility is kept under regular review, together with the pattern of funded development, by the CCLRC and the RCUK.

Commentary

- establishing the road-map would be an inclusive process for all stakeholders (including users), that could be subject to international review;
- would provide for multiple streams of funding – could be a strength (enhanced opportunity) or a weakness (greater coordination of multiple joint applications required);
- would leave the determination of new scientific directions, at each facility, to the other Research Councils for alignment with their overall science strategy;
- there would be the opportunity for other Research Councils directly to tension ‘facility development projects’ against other demands on Science Budget funding in open competition;
- the pace and priority for development would to a large measure be determined by the outcome of the peer review of individual development proposal submissions;
- can be difficult to use the other Research Council’s research grant schemes to provide for subsequent multiple copies of particular developments (e.g. sample environments and detectors);
- could be more difficult for the CCLRC to manage the integration and leverage of third party funding – if matching contributions were conditional on the outcome of separate review processes;
- development portfolio could become unbalanced if funding constraints (arising for reasons unconnected with facility development funding) were to arise for one or more of the other Research Councils.

MODELS FOR THE PROVISION OF THE CCLRC SUPPORT INFRASTRUCTURE COSTS

A list of the relevant infrastructure support costs to which this Annex refers is included for information at the end of the Annex. (Note: the following options relate to costs associated with projects and programmes other than ISIS, SRS and CLF operations that are placed with the CCLRC by the other Research Councils).

MODEL 1:

The Research Councils pay the total cost (direct and indirect costs) of programmes they place at the CCLRC.

- Under this model the total cost to the other Research Councils of placing a programme at the CCLRC would be visible.
- This goes beyond the university analogue, where the total costs are provided through a combination of dual support funding.
- This would require the CCLRC to draw together the total cost requirement from a range of funders, with the prospect of in-year and between-year variation in funding if this can not be managed concurrently.

MODEL 2:

(i) The Research Councils pay the direct costs and the programme (or volume) related indirect costs for programmes they place at the CCLRC.

(ii) The CCLRC receives direct funding from the OST for the non-volume related indirect costs.

- Under this model the other Research Councils would meet the variable, project-related, costs associated with placing a programme at the CCLRC, while the fixed costs would be provided through direct funding from the OST.
- This model equates more closely with a university analogue.
- This would facilitate the effective and efficient medium term management of the non-volume related indirect costs by the CCLRC, in cooperation with other stakeholders, as described elsewhere in the report. Would also improve the ability of the CCLRC to put in place 'spend-to-save' initiatives.
- Management information could be provided on the full costs of programmes for those funders that require it.

MODEL 3:

(i) *The Research Councils pay the direct costs of programmes they place at the CCLRC.*

(ii) *The CCLRC receives funding from the OST for all indirect costs.*

- Under this model the Research Councils would provide only the additional direct project costs associated with placing a programme at the CCLRC, while all indirect costs would be provided through funding from the OST.
- This model goes beyond the university analogue, which for research grant funding from the Research Councils currently includes a 46% indirect cost charge on staff costs.
- This would facilitate the effective and efficient medium term management of all infrastructure support costs by the CCLRC, in cooperation with other stakeholders, as described elsewhere in the report. Would also improve the ability of the CCLRC to put in place 'spend-to-save' initiatives.
- Management information could be provided on the full costs of programmes for those funders that require it.
- It may be difficult to plot the likely actual total infrastructure support costs (that is volume-related and non-volume related) for a full spending review period since it would depend, in part, on the volume of business placed with the CCLRC.

ACCOMMODATION AND CORE ACTIVITY ANALYSIS

Accommodation

Site Rates
Estates Management
Utilities
Minor Building Works
Cleaning
Fire/Ambulance
Infrastructure

Core Activity

Directorate
Finance
Press and Public Relations
Human Resources
Restructuring
Health and Safety
IT Support
Library
Marketing & Business Development
General Administration & Maintenance