

Mr Richard Lambert
Lambert Review of Business-University Collaboration
1 Horse Guards Road
London
SW1A 2HQ

11th April 2003
MGJWH 5228/LCW

Dear

**Rolls-Royce response to the Lambert Review of Business -
University Collaboration**

Thank you for the opportunity to provide an input to the Business-University collaboration review. I have attached to this letter our formal response to the questionnaire. This response is based primarily on our experience in developing Rolls-Royce's 17 UK University Technology Centres (UTCs). Since their initiation over 10 years ago these centres have increasingly become an integral part of our company research and technology programme and now provide support for all stages of our technology activities ranging from pre-competitive research through to in-service product technology insertion.

There is clearly considerable experience in Rolls-Royce on the operation of these centres and it is impractical to encapsulate all of this within the response to the questionnaire. Following our discussions with you earlier in the year and the submission of this response I would welcome the opportunity to talk with you in more detail on both the content of our response and the broader issues of business-university collaboration. Dr David Clarke is responsible for the development of our university relations and has contacted your office to arrange a date for a meeting. In addition, you may find it valuable to visit one of our UTCs independently to assess their view of the relationship. If you would like to do this then I will arrange for appropriate contact details to be sent to you.

Yours sincerely

Dr M G J W Howse

Copy: R J Parker, D A Clarke, E Williams, K Fulton

Rolls-Royce response to the Lambert Review of Business-University Collaboration

Rolls-Royce welcomes this review of a critical relationship which links UK knowledge creation, skills development and technology exploitation. This response reflects the operation by Rolls-Royce of its 17 University Technology Centres (UTCs) in the UK and addresses the four primary questions raised in the review questionnaire:

1. Identification of best practice and examples of excellence in collaboration
2. Strengthening business-university collaborative relationships
3. Attraction of high calibre graduates / post-graduates to business
4. Financial considerations in operating the relationships

Rolls-Royce has a long-standing and extensive relationship with the UK University sector, primarily through the company's creation of UTCs in the essential fields of science, engineering and technology (SET).

The UTCs are world-class research centres containing a 'critical mass' of leading researchers and facilities all addressing the future technological needs of Rolls-Royce. The groups are underpinned by long-term committed funding from Rolls-Royce and the Company provides the research teams with both cutting-edge technological challenges and a clear technology exploitation route.

Over the last 15 years the UTCs have increasingly demonstrated their importance as the key underpinning knowledge base for the company. In return the relationship offers the universities a direct route for exploitation of scientific ideas, knowledge and expertise. The close link between Rolls-Royce and the UTCs allows development of an enhanced focus to undergraduate and post-graduate training programmes. Both sides have benefited from the recruitment of significant numbers of individuals from the UTCs into the company.

Overall, this model of close working has proved substantially and demonstrably more effective than the company's previous approach of more ad-hoc, and less focused, relationships with academia.

Within the context of this type of relationship and with the move to greater 'self-administration' by Universities of government awarded research funding there is an emerging need for many University departments to initiate and operate more comprehensive and inclusive long-term strategies which address the development of their overall research direction, staffing and facilities.

The specific points raised in the consultation are addressed below.

1. Best practice and excellence in business-university collaboration

Within the UK the Rolls-Royce University Technology Centres are generally regarded by industry, academia and government as an example of best practice in engineering and technology research collaboration. This model is outlined below and is now being replicated by other engineering-based groups, and by competitors and partners to Rolls-Royce in other countries (notably the USA).

The UTC relationship is based on a committed, long-term funding stream from the company which allows the University to recruit high-calibre researchers on a secure basis. In addition the ownership and exploitation of Intellectual Property (IP), and the ability to publish the results of research projects are all established in an 'umbrella agreement' in advance of the UTC being launched. This eliminates the subsequent problem of reaching agreement on IP ownership and exploitation on a project-by-project basis.

On projects operated outside the UTCs, reaching agreement on IPR increasingly imposes significant delays on starting research projects. This has been exacerbated following the publication of the White Paper; 'Excellence and Opportunity, a Science and Innovation Policy for the 21st century'. This paper recommended increased emphasis on management, ownership and exploitation of IPR by universities. In too many cases universities appear to view this as meaning they should seek to own and exploit IPR when they clearly have inadequate market access or product development facilities to achieve this aim.

The working relationship between Rolls-Royce and the UTCs is very close with the research direction – both short term and long term – set via privileged access by both sides to business, technology and product critical information. This is made effective by regular site visits and staff secondments. Rolls-Royce clearly benefits from accessing a highly skilled group of scientists and engineers and the university staff are, in turn, challenged by leading-edge technology problems. These problems are communicated to the university through regular contact mechanisms including Company advisory boards, routine management meetings, talks and lectures by Rolls-Royce staff and staff/researcher secondments.

Most of the UTCs have taken a significant time to establish, with Rolls-Royce staff working with the academic groups for several years before the formal creation of the UTC. This allows for the development of an effective working relationship.

In addition to the direct benefit of project results application in the company, the UTCs significantly enhance the UK knowledge-base as evidenced by the publication in the last 5 years of over 280 conference papers and journal proceedings by university staff working on Rolls-Royce supported projects.

To date, there has been little involvement of the Regional Development Agencies (RDAs) in the establishment of the UTCs. In establishing the benefits of greater involvement of the company's supply chain in university-based research, the opportunities for utilising the RDAs are increasing. It is essential that we arrive at a national strategy which is regionally deployed, and not a multiplicity of regional strategies. There are currently clear risks of duplication of high-cost facilities with multiple RDAs seeking to establish local capabilities in what are perceived as key SET fields for the future.

2. Strengthening business-university collaborative relationships

The operation of relationships today (in all engineering and technology sectors) is primarily constrained by IP agreement and by a general lack of clear, long-term development strategies in university departments. This latter point is exacerbated by government funding and support for research groups still being allocated largely on a short-term basis (three year contracts).

The initiative being taken by EPSRC to award extended, large contracts to university research groups is welcomed in this respect as it provides both continuity of support and reduction in the bureaucracy of funding applications. As exemplified within the flagship programme of Innovative Manufacturing Research Centres (IMRCs), this approach should deliver improved value and effectiveness.

Effective operation of an IMRC, and similar long-term research awards, requires that the university manage a long-term strategy for its own development, based on the exploitation of results through a diverse range of industrial concerns and partners. It appears that this is proving challenging for many university groups where the baseline approach is essentially an ongoing programme of diverse projects based around key academics personal research interests, rather than an integrated range of topics. This is a major impediment for effective relationships with business where the academic group's long-term strategy clearly needs to be capable of effective linkage to the industrial group's requirements.

EPSRC appear to be leading the research councils with their willingness to enter into constructive dialogue with business and the universities in identifying innovative mechanisms for the way in which the research councils can assist in improving the operation of the business-university interface. This has resulted in step-change improvements in the ability to recruit high-calibre staff through the 'star appointment' scheme. In addition, their consideration of funding very large responsive mode proposals with 'non-competing' independent peer review through international panels is opening up opportunities for building new, world-class research teams in the UK.

The bulk of business-university collaboration on SET involves large businesses rather than SMEs. Mechanisms are needed to support the involvement with universities of SMEs and supply-chain companies. This is critical to ensure that effective technology exploitation occurs across the full range of business activities.

3. Attraction of high-calibre graduates and postgraduates to business

The direct involvement of business with universities, in an intimate relationship, is the strongest approach to establishing the optimised training courses that meet the business sector need for skilled recruits. This implies involvement of business, not just in research-programme definition, but in departmental advisory boards, external examination roles and similar bodies. The majority of SET departments now utilise relevant and experienced business-based individuals in such bodies, and these are influencing course structures. In some cases individual companies work directly with universities to design education programmes - particularly at Masters level. If an individual company has a requirement for a particular specialist skill this approach can be more effective than trying to incorporate the topic into undergraduate programmes.

In the aerospace sector there is a requirement for a more diverse range of skills than previously. With changes in the technical requirements and business models used across the industry there are emerging needs for skilled and innovative individuals in areas such as systems engineering, electrical engineering, materials technology and manufacturing engineering.

Company representatives sit on the Careers Advisory Boards at a number of universities allowing businesses to work directly with the staff that are supporting students in their job search activities. In turn, this allows businesses to assess the way in which students are approaching career decisions and provides careers advisors with direct links to the changing skill needs of companies. Professional bodies that specify the educational requirements associated with professional registration directly influence course content. Despite these mechanisms, there is still a tendency to be backward-looking. An effective mechanism for industry and academia to identify future skill requirements remains to be discovered.

In addition to these direct methods there is indirect involvement of business with academic policy formulators through groups such as the Professional Institutes, the CBI Inter-Company Academic Relations Group (ICARG), the Engineering and Technology Board (ETB), HEFCE and Universities UK. These linkages allow for the more general identification of areas for improvement. The ETB and in particular its Education and Professional Development Panel is a new forum that is designed to allow representatives from universities, employers, professional bodies and government to address issues around attracting high-quality graduates to careers in science, engineering and technology.

It is clear that by placing students in businesses, either on short term placements or as part of a formal internship programme, both business and the universities gain the most direct understanding of the requirements for university training programmes.

4. Financial considerations in operation of effective business-university relationships

Financial considerations are an integral part of the relationship between business and universities. They must not however, be allowed to undermine the necessity for ensuring that the universities retain their position as public sector bodies in terms of publications and support to society. Rolls-Royce handles this issue by building long-term trust with the universities and by guaranteeing a level of funding over several years. This commitment supports the universities' submission of strong research proposals to government agencies. It is in the Company's interest to secure the co-operation of academics who are the worlds-best. They will only retain this status if they are able to excel amongst their academic peer group in terms of publication and recognition.

The level of bureaucracy and management activity associated with the utilisation of many funding sources is burdensome to university academics, especially when the rate of success on proposals is frequently less than 50%. As highlighted in section 2, the establishment of larger, long-term research award systems is a significant improvement in this respect, but there is a need for improved management systems within the universities to make the most effective utilisation of these funds. The use of dedicated, but remote, management teams (e.g. external consultants) is not a mechanism that can obviously add significant value to the current process. Whilst the ability of Universities to recover realistic overheads from engagement in Government, EC or Industry-funded programmes is essential – and does not generally occur today – the universities clearly must manage cost reduction of their non-value-adding, administrative processes with the same vigour that occurs in industry.

On the specific issue of large company R+D tax credits it is currently too soon to establish whether this support mechanism is impacting on business-university relationships.