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Audit Report No. 51, 2001–2002

Research Project Management

Commonwealth Scientific Research and Industrial Organisation (CSIRO)

Introduction

Background

3.1   CSIRO is a large national research organisation employing over 6500 staff organised in 21 divisions across 66 sites in Australia. Its primary functions are to carry out scientific research to assist Australian industry; to contribute to the national and international objectives and responsibilities of the Commonwealth Government; and to encourage or facilitate the application and use of the results of its own or any other scientific research.

3.2   In 2000–2001 CSIRO spent around $700 million on its research and development activities. Its funding comes mainly from Commonwealth budget appropriation funds–around 67 per cent in 2000–2001. The remaining funding is revenue from external parties.

3.3   CSIRO estimates that it manages around 3000 research projects each year. These projects are intended to provide:

- benefit to Australia's industry and economy;

- environmental benefit to Australians;

- social benefits to Australians; and

- support Australia's national and international objectives through excellence in science and technology and in the provision of advice and services.

There are three main types of projects:

- appropriation projects, which are funded solely from appropriation sources, have no external client and for which intellectual property (IP) is held fully by CSIRO;

- co-investment projects, funded by a mix of appropriation and external revenues, and IP is usually shared; and

- consulting projects, which are intended to be fully funded by external clients and where IP is usually held by the client.

3.4   These projects vary widely in size, duration and topic. Most are small but the three hundred largest projects account for half of all expenditure. Around half the projects are applied research.

The ANAO Audit

3.5   The objective of the audit was to assess the effectiveness of CSIRO in administering research projects to deliver required results. In particular, the audit examined:

- structures for project management in CSIRO;

- the alignment of projects with strategic objectives;

- the adequacy of project planning;

- the monitoring and reviewing of project performance; and

- CSIRO's approach to assessing project outcomes.

3.6   The audit focused on research activities that were either formally designated as projects, or managed as projects and on relevant supporting administrative and information systems. The audit did not assess the

quality of scientific analysis or outcomes, although it did address CSIRO's assessment of project outcomes.

Audit Findings

3.7 CSIRO has an international reputation for scientific excellence, with external reviews indicating it delivers positive returns to the Australian community. It has wide experience in managing research projects. However, further strengthening of several aspects of project management arrangements is required in order to provide appropriate assurance that research projects are conducted in a cost-effective manner. This is particularly the case for research activities funded by appropriation moneys.

3.8 CSIRO's framework for project management has been upgraded in recent years and is supported by related corporate policies and divisional practices. However, there are insufficient corporate standards and guidance on project management; and some existing policies are not well implemented.

3.9 CSIRO places strong emphasis on aligning its research portfolio with industry-based Sector priorities, with supporting processes to properly allocate funds to programs, sub-programs and projects. The prioritisation of individual projects was supported by systematic criteria in some areas of CSIRO, but not in others. The extent of supporting documentation varied across divisions.

3.10 All co-investment and consulting projects examined by the ANAO met corporate requirements for documented project plans/proposals, including a project budget. However, there are no similar requirements for appropriation projects and only a third of such projects included a plan while only half had a budget. In addition the omission from project budgets of corporate overheads; the diversity of practice in pricing projects; and the absence of structured, project level, risk assessments need to be addressed by CSIRO.

3.11 There is a range of processes to regularly monitor and review project progress which have a particular focus on maintaining scientific quality, and are robust. However, processes to monitor changes to project scope and risks were not well documented and less systematic and transparent, particularly for appropriation projects. CSIRO's ability to monitor and review project costs and timeliness was significantly reduced by inadequate or inconsistent data in key management information systems.

3.12   CSIRO has a policy of undertaking systematic post project review, with a focus on the more 'significant' projects. However, this policy is not widely implemented, thus reducing CSIRO's ability to assess outcomes of individual projects and to identify lessons for management improvement.

3.13   Limitations in the conduct of project completion reviews and management information meant that the ANAO could only draw on limited data on cost and timeliness results. These data, whilst being subject to a number of caveats, suggest costs are exceeding contracted revenue for many projects. Occasionally, appropriation funds have been used to fund overspends in consulting or co-investment projects. As well, project milestones are often met later than planned. A more systematic collection and analysis of such data would provide greater insight into these important aspects of project performance.

Committee Concerns

3.14   At the public hearing on 23 August 2002 the Committee inquired into several areas of CSIRO's project management. These were:

- Development of Project Management expertise;

- Variability in quality of Project Management;

- Cross-subsidisation of externally funded projects;

- Costing practices ; and

- The Control of Intellectual property.

Development of project management expertise

3.15   The Committee was concerned about the apparent lack of project management expertise throughout CSIRO. CSIRO spends more than $700 million dollars in research and development each year and so project management is an important function for the cost effective expenditure of Commonwealth resources.

3.16   At the hearing CSIRO advised that it had addressed the lack of project management expertise with considerable training and development efforts.[1]

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1   Transcript, pp. 18-19.

Committee Comment

3.17   The Committee notes that many of the differences in management practices between projects are cultural differences within the various divisions of the CSIRO. A key challenge for the CSIRO is to ensure that project management across the organisation improves in a systematic and structured way.

3.18   The Committee considers that CSIRO needs to pay attention to establishing and implementing consistent practices across the organisation, in order to facilitate consistent and coherent project management.

Variability in quality of project management

3.19   The Committee was concerned by the variability in project management standards between projects. For example, the ANAO found that externally funded projects were more likely to have effective project management than internally funded projects.[2]

3.20   The CSIRO attributed this to the long term nature of the internally funded projects and the differing demands of industry in externally funded projects. However, the Committee noted that, if the model applied to externally funded projects was applied to those funded entirely by appropriations, a number of the disparities would be resolved.

3.21   The CSIRO advised the committee that:

> Generally speaking, when a project is formulated for an industrial partnership, there are pretty clear guidelines. Even then, obviously a project can blow out. When, however, it is about the creation of new knowledge, then it really is quite difficult to predict exactly how a project will come out. Handling contingencies is one of those difficulties that we have in the day-to-day life of our senior managers.[3]

3.22   The Committee considers, however, that the disparities demonstrate a lack of depth in project management skills across the CSIRO.

3.23   The CSIRO acknowledges that there needs to be considerable cultural change in order for effective project management to become a corporate benchmark.[4]

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2   ANAO, Audit Report No. 51, Research Project Management, p. 13.
3   Sandland, *Transcript*, p. 22.
4   Sandland, *Transcript,* p. 19.

Committee Comment

3.24   The Committee notes that there has been significant effort expended by CSIRO in improving project management of all projects. However, project management within CSIRO would be enhanced by a consistency of project management practices across divisions and across projects and training in a consistent project management methodology.

Recommendation 4

3.25   **The Committee recommends that the Commonwealth Scientific and Industrial Research Organisation develop and implement a consistent and coherent model of project management across the organisation.**

Cross-subsidisation of externally funded projects

3.26   The Committee noted that a number of projects which were to be externally funded were subsidised unintentionally from appropriations due to insufficient accounting and costing rigour.

3.27   In response the CSIRO advised that since 1 July 2002 the corporate overheads have been allocated on a project by project basis.[5]

Costing practices

3.28   The CSIRO advised the Committee that:

> I think it would be fair to say that probably we are adopting a more prescriptive approach from a corporate perspective in terms of definitions of projects and how people should use the systems. I think the audit finding was that we do have a project support system that identifies costs and other aspects of each project but we have not actually been prescriptive across all of those business units as to how they ought to use that system.[6]

3.29   However, the Committee noted that there were still significant difficulties in determining the true costs of a project. The Committee noted other evidence by the CSIRO that there is some disparity between what is

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5   Garrett, *Transcript*, p. 22.
6   Garrett, *Transcript*, p. 18.

happening in a particular project and the information available through financial and project systems.[7]

3.30   In part, this anomaly should be addressed by the work that CSIRO is planning to undertake in the next twelve months in relation to project management processes. However, the Committee considers that more attention should be paid to accurate, complete and competent costing of projects.

The Control of intellectual property

3.31   The ANAO noted that the pricing structure for consulting projects depended, in part, on the amount of intellectual property retained by CSIRO, reflecting the value of the project to CSIRO.[8] However, the ANAO observed that there were no clear guidelines on valuing intellectual property leading to a diversity of practice.[9]

3.32   CSIRO also advised that there was a diversity of practice regarding the retention of intellectual property depending on the funding source of the project and any specific agreements with project partners.[10]

3.33   The Committee urged CSIRO to develop clear policy guidelines for the retention of IP which are more consistent across various types of projects.[11] In this regard the committee drew the CSIRO's attention to the system in place at Purdue University in Indiana where a single non-negotiable policy is in place which sees intellectual property where the company retains one third, the university one third and the researcher one third. [12]

Recommendation 5

3.34   **The Committee recommends that the Commonwealth Scientific and Industrial Research Organisation develop and implement clear and consistent policy guidelines for the retention of intellectual property.**

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7   Garrett, *Transcript*, p. 25.
8   ANAO, Audit Report No. 51, p. 63.
9   ANAO, Audit Report No. 51, p. 63.
10   Sandland, *Transcript*, p. 24.
11   *Transcript*, p. 24.
12   *Transcript*, p. 24.