Research Project Management
Follow-up Audit

Commonwealth Scientific and Industrial
Research Organisation (CSIRO)

Canberra   ACT
19 October 2004

Dear Mr President
Dear Mr Speaker

The Australian National Audit Office has undertaken a performance audit in the Commonwealth Scientific and Industrial Research Organisation in accordance with the authority contained in the *Auditor-General Act 1997*. Pursuant to Senate Standing Order 166 relating to the presentation of documents when the Senate is not sitting, I present the report of this audit and the accompanying brochure. The report is titled *Research Project Management—Follow-up Audit.*

Following its presentation and receipt, the report will be placed on the Australian National Audit Office's Homepage—http://www.anao.gov.au.

Yours sincerely

Oliver Winder
Acting Auditor-General

The Honourable the President of the Senate
The Honourable the Speaker of the House of Representatives
Parliament House
Canberra   ACT

AUDITING FOR AUSTRALIA

The Auditor-General is head of the Australian National Audit Office. The ANAO assists the Auditor-General to carry out his duties under the *Auditor-General Act 1997* to undertake performance audits and financial statement audits of Commonwealth public sector bodies and to provide independent reports and advice for the Parliament, the Government and the community. The aim is to improve Commonwealth public sector administration and accountability.

For further information contact:
The Publications Manager
Australian National Audit Office
GPO Box 707
Canberra ACT 2601

Telephone: (02) 6203 7505
Fax: (02) 6203 7519
Email: webmaster@anao.gov.au

ANAO audit reports and information about the ANAO are available at our internet address:

http://www.anao.gov.au

Audit Team
Alan Greenslade
Alex Geue
Joanne Elkner

Contents

Abbreviations/Glossary

Baseline budget   The first approved budget for a project

CIS   Commercial Information System, one module of the Project Support System

CSIRO   Commonwealth Scientific and Industrial Research Organisation

CVS   Customer Value Survey

Division   CSIRO's semi-autonomous operating and business units for research and commercial matters. Each has its own special set of skills and capabilities.

OPU   Organisational Performance Unit

PMI   Project Management Improvement

PSS   Project Support System

RA&A   Risk Assessment and Audit Branch

Summary and Recommendations

Summary

Background

1.   The Commonwealth Scientific and Industrial Research Organisation (CSIRO) manages some 4500 research projects each year, at a cost of $824 million in 2003–04.

2.   ANAO Audit Report No.51 of 2001–02, *Research Project Management— Commonwealth Scientific and Industrial Research Organisation*, assessed the effectiveness of CSIRO in administering research projects to deliver required results. The audit made nine recommendations designed to improve research project management in CSIRO.

3.   The Joint Committee of Public Accounts and Audit (JCPAA), subsequent to reviewing the audit report, also made a recommendation in regard to CSIRO's project management. It recommended that CSIRO develop and implement a consistent and coherent model of project management.

4.   The purpose of this follow-up audit was to assess the extent to which CSIRO has implemented the recommendations of the previous audit and of the JCPAA.

Key findings

5.   Key findings against specific recommendations of the previous audit are summarised in Figure 1.

Figure 1

Progress in implementing recommendations of the previous audit and the JCPAA

Subject of recommendation	Progress of implementation
Recommendation No. 1	CSIRO has implemented the major thrust of this recommendation.
That CSIRO develop and implement a corporate approach to the management of research projects, including: (a) business rules incorporating risk based standards and other guidance for the management of projects, including appropriation projects; (b) consistent identification of activities that should be managed as research and development projects;	CSIRO has established an explicit framework for project management. It has a project management guide that addresses areas of weakness identified in the previous audit. In particular, there is sound management of appropriation projects. The quality of data in management information systems has improved and training is now linked to CSIRO's new project management framework.

Subject of recommendation	Progress of implementation
(c) ensuring key management information systems contain reliable data; (d) ensuring relevant staff have project management skills; and (e) arrangements to ensure compliance with corporate project management standards and guidance.	However, CSIRO continues to have some difficulties in ensuring that policies are implemented consistently, particularly in regard to the conduct of project risk assessments. There are also considerable shortcomings in the reliability of management information on project budget, cost and timeliness. These hamper CSIRO's ability to monitor the extent to which projects are delivered on time and to budget.
Recommendation by the JCPAA	CSIRO has implemented the major thrust of this recommendation.
That CSIRO develop and implement a consistent and coherent model of project management across the organisation.	See response to Recommendation 1 above. CSIRO has now developed and is in the process of implementing a standard model of project management.
Recommendation No. 2	Part (a) of the recommendation has not been implemented, part (b) has been implemented.
That, to reinforce the alignment of projects with strategic priorities, CSIRO: (a) employ explicit criteria in selecting projects; and (b) identify in project planning the contribution of the project to agreed industry sector or divisional priorities.	CSIRO devotes substantial effort to selecting projects. However, this is not supported by systematic processes based on explicit criteria, as was recommended. The contribution of projects to agreed priorities is now consistently recorded in project plans or other documents.
Recommendation No. 3	Implementation of this recommendation is still in progress.
That in order to facilitate a more robust approach to project management, CSIRO develop guidance and supporting practices to ensure that projects have appropriate, documented and readily accessible implementation plans.	CSIRO has established appropriate policies and guidance on the use of project plans, but the use of plans in practice remains variable.
Recommendation No. 4	This recommendation has been implemented.
That CSIRO enhance its costing policies to provide clear policy and guidance on: (a) costing of appropriation projects; and (b) the distribution of corporate overheads to research projects.	CSIRO has markedly expanded its guidance on costing projects, including appropriation projects, to require that all have a budget. CSIRO now requires all corporate and divisional overheads and support costs to be attributed to projects.

Subject of recommendation	Progress of implementation
Recommendation No. 5	Implementation of this recommendation is still in progress.
That planning address project risk assessments and management to an agreed standard, including project delivery risks.	CSIRO has expanded its project risk management policy and guidance. This requires all projects to have a documented risk assessment. However, less than half the projects examined had a risk assessment.
Recommendation No. 6	This recommendation has been implemented.
That CSIRO articulate standards and procedures for approving, managing and documenting scope change for projects.	CSIRO has comprehensive guidance on the management of scope change.
Recommendation No. 7	Implementation of this recommendation is still in progress.
That CSIRO: (a) record on PSS budgets and the actual effort expended on projects, including for appropriation projects, and (b) develop procedures on the monitoring and funding of project cost over-runs.	CSIRO policy requires budgets to be recorded and for the actual effort devoted to projects to be recorded. However, one-third of projects created since 1 January 2003 did not have a budget recorded in PSS. CSIRO has put in place a number of initiatives to improve the monitoring and control of costs. It is progressively reducing the subsidy of consulting projects.
Recommendation No. 8	This recommendation has not been implemented.
That achievement of milestones is recorded in relevant information systems.	The extent to which milestones are recorded in key systems is still less than required to support effective reporting and monitoring.
Recommendation No. 9	This recommendation has been largely implemented.
That, in order to maximise organisational learning from project management experience, CSIRO implement a systematic approach to project completion review that addresses the key aspects of project performance.	CSIRO has clear policy on the conduct of project completion reviews. This policy is generally complied with.

Conclusion

6. CSIRO has implemented two of the nine recommendations made by the previous audit and the recommendation of the JCPAA. CSIRO has made progress in implementing five of the other recommendations. One recommendation relating to recording the achievement of milestones, and part of a recommendation relating to the use of explicit criteria in selecting projects have not been implemented.

7.   CSIRO is continuing to enhance project management in the areas subject to recommendations in the previous audit. This follow-up audit includes some suggestions to assist in this process.

8.   Overall, CSIRO's management of research projects has improved. The establishment of a corporate framework and policies for project management underpins improvements. CSIRO also documents how projects align with research priorities, more consistently plans and costs projects and more systematically conducts post-project reviews.

9.   However, full implementation of some recommendations is hampered by shortcomings in the quality of management information. This limits CSIRO's ability to monitor the extent to which projects are delivered on time and to budget. Furthermore, despite CSIRO's efforts to ensure compliance, there remain a number of important aspects of its new framework which are not implemented in practice, in particular the use of project plans and project risk assessments.

CSIRO Response

10.   CSIRO's response to the follow-up audit can be found in full at Appendix 3. CSIRO also provided the following summary:

> CSIRO welcomes this Follow–up audit by ANAO to Audit Report No.51 of 2001–02, *Research Project Management—CSIRO.*

> We are continuing to place strong emphasis on improving project management skills and practices across CSIRO, and believe that this report highlights the positive changes that have occurred over the past two years. Further initiatives are either currently in progress or planned for the short term that will address incomplete matters raised by ANAO in the initial audit and suggestions raised in this follow-up audit.

Audit Findings
and Conclusions

1. Introduction

This chapter provides background on CSIRO, outlines the scope of the previous audit and the objective, scope and methodology of this audit.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO)

1.1   The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is a large national research organisation employing over 6600 staff across 60 sites in Australia. Its primary functions are: to carry out scientific research to assist Australian industry and to further the interests of the Australian community; to contribute to national and international objectives and responsibilities of the Australian Government; and to encourage or facilitate the application and use of the results of its own or any other scientific research.

1.2   In 2003–04, CSIRO's project ledger reflects expenditure of around $824 million on its research and development activities. This comprised $528 million directly on research projects and $296 million on business unit and corporate support costs.[1] CSIRO advised that it had some 4500 active research projects during 2003–04.[2]

Research projects in CSIRO

1.3   The means of funding research projects varies. Broadly, there are three types of projects, which are summarised in Table 1.1.

---

[1]   These corporate costs are ultimately attributed to research projects as indirect costs.

[2]   CSIRO also manages a large number of support activities that contribute to research (such as information technology, training or other functions). These were excluded from the audit, which focuses on scientific research projects.

Table 1.1

Summary of project types in CSIRO as at April 2004

Type of project	Nature	Example	Number of projects at 1 April 2004	Estimated whole of life expenditure on these projects ($ million)
Appropriation	Projects funded solely from appropriation sources. There is no external client. CSIRO holds the intellectual property associated with these projects.	Develop and test a tool to assess current revegetation practices.	1,277	680.0
Co-investment	Projects funded by a mix of appropriation and external revenues. There is an external client and intellectual property is usually shared between the client and CSIRO.	A project to study the health benefits of particular grains, partly funded by an overseas agricultural agency.	2,156	1,347.7
Consulting and services projects	These projects are intended to be totally externally funded, with an appropriate profit margin.	A project to examine the health benefits of fortified foods for a food company. A project to advise a steel company on desirable health and safety improvements in an overseas smelting facility.	1,031	238.3
	Total		4,464	2,266.0

Source: ANAO analysis of CSIRO documentation and data.

1.4   Research projects vary in size. Figure 1.1 shows the distribution of each type of project by their total cost.

Figure 1.1

Research projects active during 2003–04 by total project cost
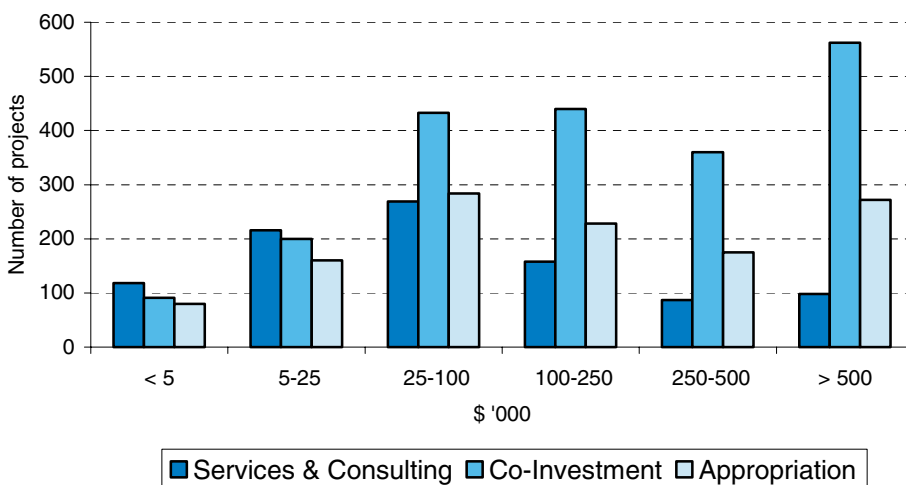
Source: CSIRO
Note: Older projects, for which there is no reliable data, have not been included.

1.5   Another way projects vary is in regard to their research focus. The Australian Bureau of Statistics (ABS) categorises research across a spectrum from pure basic research, where there is a focus on the advancement of knowledge, to experimental development, which utilises existing knowledge to produce new or improved materials, processes or services. Figure 1.2 shows the distribution of CSIRO's research effort for the ABS categories. Almost half of CSIRO's research is categorised as applied research, that is, research undertaken primarily to acquire new knowledge with a specific application in view.

Figure 1.2

Distribution of CSIRO research expenditure by activity type for 2003–04
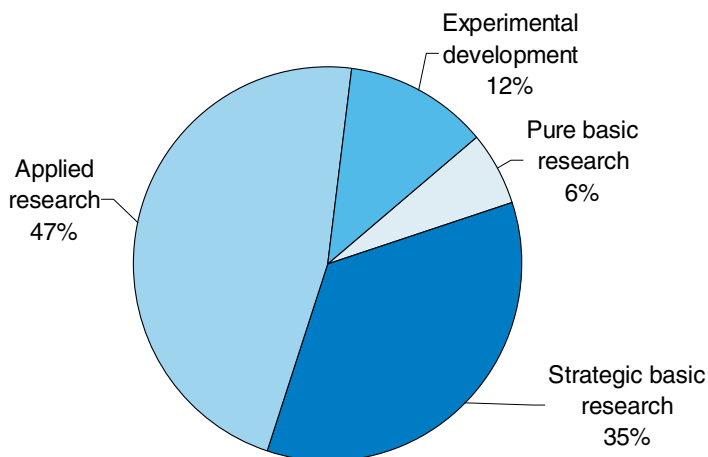
Source: CSIRO

1.6   Projects are managed by 21 divisions, spread across a wide range of scientific disciplines, diverse markets and geographic locations.

The previous audit

1.7   The previous audit, Report No.51 2001–02, *Research Project Management—Commonwealth Scientific and Industrial Research Organisation* (Canberra, 2002), concluded that CSIRO had wide experience in managing research projects. However, further strengthening of several aspects of project management arrangements was required in order to provide appropriate assurance that research projects, funded by substantial Australian Government and private sector investment, are conducted in a cost-effective manner. This was particularly the case for research activities funded by appropriation moneys, which tended to lack important elements of structured project management.

1.8   Identified areas for improvements were:

-   developing and implementing a structured approach to project management across the organisation (Recommendation No.1);

-   aligning projects with strategic priorities (Recommendation No.2);

-   project planning (Recommendation Nos 3, 4 and 5);

- monitoring and reviewing project performance (Recommendation Nos 6, 7 and 8); and

- assessing project outcomes (Recommendation No. 9).

1.9 CSIRO agreed to all recommendations.

1.10 The Joint Committee of Public Accounts and Audit (JCPAA) subsequently reviewed the ANAO audit report. It recommended that CSIRO develop and implement a consistent and coherent model of project management across the organisation.[3] CSIRO also agreed to this recommendation.

This audit

Audit objective and scope

1.11 The objective of this follow-up audit was to assess CSIRO's implementation of the recommendations of the ANAO in the previous audit, and the recommendation by the JCPAA. It also sought to determine whether implementation of these recommendations had improved CSIRO's management of research projects.

1.12 The audit focused on management processes and policies at the corporate level, the implementation of policies by CSIRO divisions and the application of policies within individual projects.

1.13 Where relevant, the audit also identified areas of better practice.

Audit methodology

1.14 The audit methodology comprised:

- review of a submission by CSIRO on progress made in implementing the recommendations of the previous audit;

- examination of corporate and divisional documentation;

- interviews with senior corporate and divisional staff and project managers in CSIRO divisions;

- analysis of project management practices in three CSIRO divisions;

---

[3] Joint Committee of Public Accounts and Audit, *Report No.393* (December 2002). The JCPAA also made a recommendation in regard to the management of intellectual property that was outside the scope of the audit.

- review of 25 research projects commenced after 1 January 2003[4] from the three divisions. The projects were a mix of large and medium size appropriation funded, co-investment and consulting projects;

- analysis of information from CSIRO project information systems; and

- examination of relevant reviews undertaken by CSIRO internal audit.

1.15   Fieldwork was conducted at CSIRO's Corporate Headquarters in Canberra, and at divisions in Melbourne, Adelaide and Canberra.

1.16   Audit fieldwork included examining the management of some projects undertaken as part of CSIRO's recent research initiatives: Flagship Programs and Emerging Science Areas.[5] These two initiatives account for $105.6 million of appropriation funding in 2003–04. This is equivalent to 18 per cent of the total CSIRO appropriation funding for research.[6] Projects supported by these initiatives will be either appropriation funded or co-investment projects.

1.17   The audit was conducted in accordance with the ANAO auditing standards at a cost of $150 000. The ANAO engaged Origin Consulting (ACT) to assist with the conduct of the audit.

Report structure

1.18   The audit findings are reported in the five following chapters, as illustrated in Figure 1.3.

---

[4]   As CSIRO's new project management framework was implemented progressively during 2002, only projects that commenced after 1 January 2003 were sampled.

[5]   Flagships are partnerships of CSIRO, other leading Australian scientists, research institutions, commercial companies and selected international partners that aim to make a sustained contribution to economic and social growth and sustainability. The aim of the Emerging Science initiative is to increase investment in emerging science and technology areas that show longer term promise. These initiatives were part of CSIRO's 2001 Strategic Action Plan.

[6]   In 2003–04, CSIRO received $568 million in appropriation funding from the Australian Government.

Figure 1.3

Report Structure

| Chapter 2: Structures for project management in CSIRO |
| *Previous Recommendation No.1 and JCPAA recommendation* |

| Chapter 3: Alignment of projects with strategic priorities

Previous Recommendation No.2 | Chapter 4: Project planning

Previous Recommendation Nos 3, 4 and 5 | Chapter 5: Monitoring and reviewing project performance

Previous Recommendation Nos 6, 7 and 8 | Chapter 6: Assessing project outcomes

Previous Recommendation No.9 |

2. Structures for Project Management in CSIRO

This chapter examines CSIRO's progress in implementing Recommendation No.1 of the previous audit and the recommendation by the JCPAA. It assesses the development and implementation of a corporate and systematic approach to project management by CSIRO.

Previous audit

The previous audit concluded that CSIRO had insufficient corporate standards and guidance on project management. CSIRO did not have a project management manual or guidance, nor articulated standards of project management practice. These weaknesses particularly affected the management of appropriation projects but also affected the quality and consistency of project management for consulting and co-investment projects.

There was also wide variation in what was considered a project for the purposes of applying project management disciplines.

In addition, the usefulness of corporate information systems was limited by inconsistency in the entry of project data, in particular the specification of budgets and milestone data.

While CSIRO recognised the importance of developing staff skills in project management, attendance at relevant courses was variable. Some divisions ran their own courses, which were not necessarily consistent with corporate programs.

Overall, the previous audit found that some existing policies, such as on the conduct of post project reviews, the use of PSS and conduct of risk assessments, were not well implemented.[7]

Recommendation No.1

The ANAO recommended that CSIRO develop and implement a corporate approach to the management of research projects, including:

a) business rules incorporating risk based standards and other guidance for the management of projects, including appropriation projects;

b) consistent identification of activities that should be managed as research and development projects;

c) ensuring key management information systems contain reliable data;

d) ensuring relevant staff have project management skills; and

e) arrangements to ensure compliance with corporate project management standards and guidance.

---

[7]   ANAO Report No.51 2001–02, *Research Project Management—Commonwealth Scientific and Industrial Research Organisation*, Canberra, Chapter 2.

2.1 The JCPAA also recommended that CSIRO 'develop and implement a consistent and coherent model of project management across the organisation'.[8] CSIRO agreed to this recommendation.

CSIRO's overall response to Recommendation No.1

2.2 CSIRO agreed to all recommendations of the previous audit and has placed a high priority on addressing the issues identified in Recommendation No.1. For example, in 2003 CSIRO identified the risk that 'project management processes and outcomes are sub-optimal' as one of three high risks to be managed by the organisation. To address this, it has implemented a Project Management Improvement (PMI) initiative to establish a corporate approach to project management.

2.3 The PMI commenced in late 2001, before completion of the previous audit. Its objective was to '…improve the management of projects across CSIRO, as a vital component of the transformation into a research business'. The PMI has, amongst other things, sought to address the recommendations of the ANAO audit. This includes to establish minimum standards for project management.

2.4 Initiatives undertaken as part of PMI, included:

- developing a corporate framework for project management (see paragraphs 2.7 to 2.16);

- undertaking training and development to support the new framework and enhance project management skills (see paragraphs 2.31 to 2.34);

- establishing a network of project management advisors (see paragraph 2.36);

- developing a policy and tools for project risk assessment (see paragraph 2.11); and

- developing a new IT system, known as Project Workflow, to support project management (see paragraphs 2.37 to 2.40).

2.5 The contribution of the PMI to addressing each element of Recommendation No.1 is discussed below.

---

[8] Joint Committee of Public Accounts and Audit, *Report No.393*, December 2003.

Development of project management business rules—Recommendation No.1(a)

2.6 This part of the recommendation has been implemented.

Corporate policies and guidance
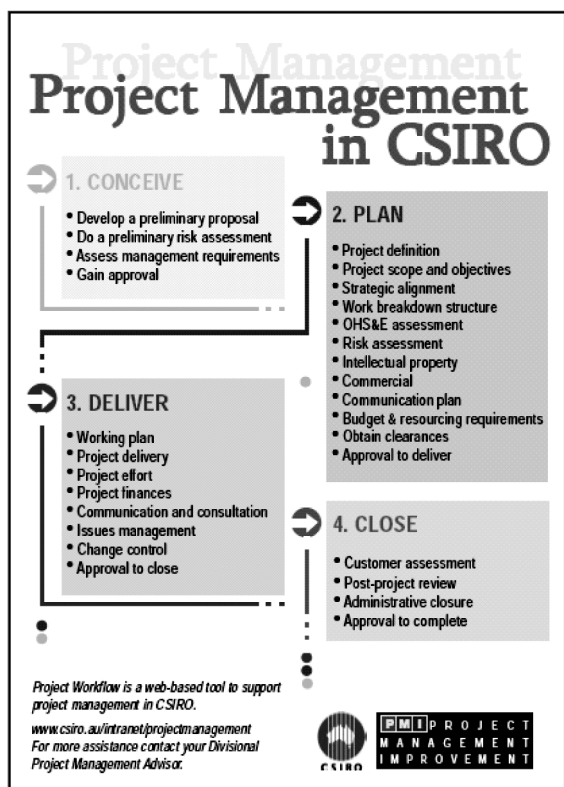
2.7 Over the period 2002–04 CSIRO management issued a number of new project management policies. These were:

- a new framework for project management in CSIRO (shown in Figure 2.1);

- an 'Effort Logging' policy issued in July 2002; and

- a 'Project Management Policy' circular issued in December 2002.

Figure 2.1

CSIRO Project Management Framework

Source: CSIRO

2.8   The contents of the Project Management Policy are summarised in Table 2.1.

CSIRO policies and procedures on project management

Policy/Guidance Document	Key Functions/Contents
Effort Logging	• All staff should systematically record the time they actually spend on projects. • Effort will be captured based on actual hours worked. • The effort logging system should be standard across all divisions.
Project Management *(the full text of the policy is at Appendix 1)*	• All work in CSIRO regardless of fund source must be managed on a project basis in accordance with a Project Plan. • All Project Plans must accord with the CSIRO Strategic Plan, the relevant annual Operational Plan and relevant budgetary allocations. • Project Plans, and significant changes to the scope of a project, must be formally approved. • Projects must be managed by a Project Leader appointed by an Authorised Officer. • Project leaders must ensure that: projects are planned, approved and monitored to ensure delivery of agreed objectives within the approved budget; CSIRO management systems contain accurate data; and projects are managed in a manner that is commensurate with their size, complexity, sensitivity and associated risks. • On completion, all projects must be reviewed. • Project budgets and financial reports should be based on full direct and indirect costs, including corporate and other overheads. • Learning and development programs for staff members should support and give effect to these policies.

Source: ANAO analysis of CSIRO documents as at April 2004

2.9   To facilitate implementation of these policies, CSIRO developed a CSIRO Project Management Guide, which was issued in May 2003. The purposes of the Guide include to:

• present a framework for project management;

• document project management policies and recommended practices; and

• improve the quality of project information.

2.10 The Guide contains the policies set out in Table 2.1 and includes supporting procedures and guidelines for their application. The Guide emphasises that the basic elements and principles of project management should be consistent across the different types of projects. The Guide notes that the extent to which aspects of project management need to be addressed will vary depending on the project. The contents of the Guide are listed at Appendix 2.

2.11 In addition to the Guide, CSIRO has also developed a Project Risk Assessment Toolbox to guide staff in the conduct of project risk assessment. The Toolbox addressed issues such as the use of risk registers and the definition, management and reporting of risk. The conduct of risk assessments is discussed further at paragraphs 4.22–4.25.

2.12 Collectively, these new policies and guidance implement Recommendation No.1(a) of the previous audit report. They address the weaknesses identified by the previous audit and support a systematic approach for the management of projects in CSIRO. In particular, they address the two key issues from the previous audit. That is, that appropriation projects should receive similar attention to other types of projects, and that project management should reflect the risk of the project.

2.13 The current state of CSIRO's policies on project management compared to their extent at the time of the previous audit is summarised in Table 2.2.

Table 2.2

State of CSIRO policy on project management

Element	Previous audit	Current	Desirable enhancement
Definition of project	p	✔	Clarify application of policy (see paragraph 2.21).
Project costing	p	✔	
Project risk assessment and monitoring	p	✔	
Project monitoring	x	✔	
Project outcomes evaluation	p	✔	

Source: ANAO

Notes:
X—none, or very limited
p—partial or is in place for some types of projects only
✔—in place for all types of projects

Divisional guidance

2.14   Divisional guidance can reinforce the implementation of corporate policies, but it is important that this guidance be consistent with higher-level policy. The ANAO found that each of the divisions examined by the ANAO had developed, to varying degrees, guidance on project management specific to the division.

2.15   CSIRO advised that the divisional guidance was developed to make the corporate policies relevant to the division's particular culture, clients and areas of research. For example:

- one division developed an extensive suite of tools and templates to guide staff;

- another was in the process of developing such guidance; and

- a third had a number of policies or tools on its Intranet, linking to corporate policies and tools.

2.16   To be effective, divisional guidance should align with corporate policies. However, in one case a divisional template was not consistent with the CSIRO policy. The ANAO suggests CSIRO review divisional materials to ensure such policies are consistent with corporate requirements.

Consistent identification of activities that should be managed as projects—Recommendation No.1(b)

2.17   This part of the recommendation has been implemented.

2.18   In contrast to its previous arrangements, CSIRO policy now specifically addresses the definition of a project for all projects. CSIRO's Policy and Guide state that '*all* research work is to be managed as a project'. The CSIRO policy states that projects are defined in terms of their objectives, deliverables and milestones.

2.19   Each of the divisions examined by the ANAO had taken steps to inform and encourage staff to define all work, particularly appropriation-funded activity, as a project. As a consequence, most projects were clearly defined as such. However, there were still some occasions where this policy was not followed.

2.20   Furthermore, the policy does not differentiate between research activity that is of an ongoing nature, and that which is best managed as a specific project. As a result, the policy results in activities (such as ongoing contributions to regional or cross-agency research activities) being defined in relevant information systems as a project, even though they lack crucial

attributes of a project, such as a defined start or end date. This has led staff to question the value of the policy more broadly.

2.21   This approach risks over-management of small projects or activities that are more in the nature of ongoing research tasks. Clearer specification of the circumstances in which the policy is applied would encourage its appropriate application.

2.22   CSIRO advised the ANAO that it has recognised these risks. It is currently reviewing application of the policy to support its appropriate application.

Ensuring key management information systems contain reliable data—Recommendation No.1(c)

2.23   Implementation of this part of the recommendation is still in progress.

Guidance on recording of project information

2.24   The new CSIRO Guide specifically addresses the recording of project cost data on the PSS.[9] The Guide reinforces that all types of projects (i.e. including appropriation projects) are subject to the requirements. In particular, the Guide states that a project or contract must be recorded as a discrete project in PSS and all income or expenditure relating to that project should be recorded to a single project code.[10] The Guide states that divisions should cease the previous practice of aggregating income or expenditure across a number of projects in a single or 'general' PSS project code, or using multiple PSS project codes for a single project to separate income and expenditure for external reporting.

2.25   In addition, the Guide states that project budgets should be recorded and updated appropriately and that once projects are complete, any deficit or surplus should remain visible and the PSS project closed. Under previous arrangements it had been difficult to consistently identify whether or not the project had made a surplus.

2.26   These requirements address many of the weaknesses found in the previous audit. However, although divisions are encouraged to enter milestone data for co-investment and consulting projects into PSS, this is not mandatory (see paragraph 5.24).

---

[9]   For the purposes of this discussion, 'projects' are taken to be 'output projects' as defined by CSIRO.

[10]   A central step in the creation of a project is the allocation of a project code to the project. Allocation of such a code is required before any costs or expenses can be attributed to the project. As a corollary, within CSIRO, all costs must ultimately be attributable to a project code.

Quality of management information

2.27 The ANAO found that the quality of data in PSS had improved. A number of PSS project codes that did not relate to specific projects had been removed. Divisions are also accounting in PSS for project revenues, expenses and resulting surpluses or deficits more consistently, particularly for projects established since the new policy came into effect.

2.28 However, there remain a number of areas where data within PSS is not consistent with the policy, or sound project management practice. This is particularly so for milestone and budget information. In many cases, this data is not available or is unreliable.

2.29 As discussed in Chapters 5 and 6, these data problems make it more difficult to monitor the extent to which projects are delivered on time and to budget.

Project management skills—Recommendation No.1(d)

2.30 This part of the recommendation has been implemented.

2.31 Since late–2002 CSIRO has held a number of new training programs on project management. These include:

- Managing by Project–a half-day workshop delivered to 777 staff;

- Project Management–a three-day program delivered to 89 staff;

- Project Risk Assessment and Management–a half-day workshop delivered to 376 staff; and

- PSS Introduction workshop–a half-day workshop delivered to 215 staff.

2.32 In addition, CSIRO ran a 'train-the-trainer' program to equip a number of divisional staff to teach and facilitate the Managing by Project workshop. Sixty-two staff underwent training.[11]

2.33 The ANAO found that these courses provided a sound overview of project management techniques. The Managing by Project course material explicitly referred to, and reinforced, the new CSIRO framework on project management.

2.34 The ANAO found that CSIRO staff generally demonstrated a consistent understanding of the requirements of the new project management framework, and how to implement it. Staff interviewed by the ANAO considered the courses had enhanced their project management skills.

---

[11] These staff are counted as part of the 777 staff trained in the Managing by Projects workshop.

Compliance with corporate project management standards and guidance—Recommendation No.1(e)

2.35   Implementation of this part of the recommendation is still in progress.

2.36   CSIRO is undertaking a number of initiatives to address the previously identified lack of compliance with corporate project management policies. These include:

- the training initiatives and workshops discussed above were used to raise awareness of the new policies when they were first established (see paragraph 2.33). These were complemented by Train-The-Trainer sessions so each division had their own trainers familiar with the Management by Project policy. Management by Project is now part of the formal induction program for new staff to CSIRO;

- establishing a network of project management advisors in each division to support implementation of the new policies; conduct relevant learning and development programs; and assist individual project leaders;

- conducting a 'stocktake' of the adequacy of project documentation and the reliability of PSS data, to address weaknesses in project documentation and data quality;

- incorporating a focus on project management-related objectives into the CSIRO Strategic and Operational Plans;

- conducting two internal audits of project management practices; and

- developing performance measures for project management.

Project Workflow

2.37   One other relevant initiative is the current development of an online project management system, Project Workflow. Project Workflow is intended to support and facilitate the implementation of CSIRO's project management policies. An initial version of Project Workflow was launched in August 2003. Implementation of Project Workflow is some eight months behind its original schedule. At the time of audit fieldwork, it was still being piloted and its future implementation was being reviewed. Currently, there are no plans to make it compulsory.

2.38   Features of the system include:

- concept creation, tracking and approval documentation;

- entry of key project information such as project alignment, risk analysis and milestones;

- recording of approvals and decisions relating to issue and change management;

- integration with systems, such as PSS;

- explanation and links to relevant project management standards, training and manuals; and

- project and management reporting.

2.39   The delay in implementation of Project Workflow has reduced the availability of support tools for the new project management framework. This is because some divisions deferred improvements to local systems pending the delivery of Project Workflow.

2.40   The impact of the delay in implementing Project Workflow emphasises the importance of sound project management in all projects, including support projects. CSIRO is currently reviewing the further development and role of Project Workflow in the context of a broader review of IT system developments.

3. Alignment of Projects with Strategic Priorities

This chapter examines implementation of Recommendation No.2 of the previous audit. It assesses whether CSIRO has developed, and consistently applies, explicit criteria in selecting projects and whether it documents this alignment in project plans.

Previous audit

The previous audit concluded that, although CSIRO placed strong emphasis on aligning its research portfolio with broader research priorities, the ranking and selection of individual projects was not consistently supported by systematic criteria. Nor did CSIRO require project plans to state how the project contributed to research priorities. These weaknesses reduced assurance that CSIRO was choosing the optimal portfolio of projects.[12]

Recommendation No.2

The ANAO recommended that, to reinforce the alignment of projects with strategic priorities, CSIRO:

a) employ explicit criteria in selecting projects; and

b) identify in project planning the contribution of the project to agreed industry, sector or divisional priorities.

Use of explicit criteria in selecting projects— Recommendation No.2(a)

3.1   CSIRO agreed to this part of the recommendation. However, it has not been implemented.

3.2   CSIRO guidance now emphasises the importance of selecting projects that align with agreed research priorities. For example, the CSIRO Policy requires that projects be aligned with the CSIRO Strategic Plan. However, there is no guidance on how this is to be done.

3.3   In practice, project proposals typically undergo review at several levels and are often approved by the Chief, or Deputy Chief, of a Division. These reviews include assessment of, among other things, the relevance of the project to divisional priorities.

3.4   However, these review and approval processes are largely subjective; they are not supported by the systematic use of criteria. None of the three

---

[12]   ANAO Report No.51 2001–02, op. cit, Chapter 3.

divisions examined by the ANAO systematically used explicit criteria to rank projects and guide project selection.

3.5   CSIRO manages a diverse portfolio of projects. To deliver value for money to taxpayers, it must choose the best mix of projects from many potential project topics in order to achieve its research priorities. The lack of a structured, systematic approach with explicit criteria increases the risk that the optimal portfolio of projects may not be chosen.

3.6   In contrast, the use of formal criteria facilitates transparency and consistency in decision-making on project selection. There are some examples of better practice in this area. One of the divisions examined has made efforts at a more systematic approach to prioritising some projects. Figure 3.1 provides an example.

Figure 3.1

Better practice in project selection

An internal divisional innovation fund of $2 million per year provides early seed funding for innovative ideas. Funding bids are assessed by a committee against a set of explicit criteria. The criteria include whether the project: has the potential for innovation; is an unusual application of existing knowledge; and provides the opportunity for new services. The systematic use of formal criteria results in a transparent selection process which provides assurance that selected projects reflect priorities.

3.7   The ANAO considers that CSIRO should implement the recommendation, as previously agreed, building on examples of better practice in this area.

Identifying the contribution of the project to agreed priorities—Recommendation No.2(b)

3.8   Implementation of this part of the recommendation is still in progress.

3.9   The CSIRO Guide now requires project leaders to document in the project plan how the project accords with the CSIRO Strategic Plan, and with the relevant divisional Operational Plan. The Guide also requires that project plans note the extent to which the project will contribute to CSIRO's agreed outputs and outcomes.

3.10   The ANAO found that this requirement is largely adhered to. Around three-quarters of projects examined by the ANAO had a clearly documented relationship to agreed research priorities. This is a marked improvement compared with the situation previously audited. At that time, only some

one-quarter of project plans identified the project's contribution to research priorities.

3.11   Notwithstanding this improvement overall, adherence to the requirement varies between project types. Plans for appropriation projects generally had a clear statement of how the project contributed to research priorities. Figure 3.2 provides an example. However, this was less true of co-investment and consulting projects. Only some two-thirds of project plans explicitly identified how the project contributed to research priorities.

Figure 3.2

Better practice in documenting alignment with priorities

In one division, all proposals for appropriation-funded activity have to be documented and presented to an Appropriation Investment Committee. The proposals were required to clearly set out how the activity contributed to divisional research priorities.

3.12   CSIRO has recognised the need to further strengthen this aspect of project management. The pilot of the Project Workflow system requires project plans to explicitly state the contribution of the project to research priorities.

4. Project Planning

This chapter assesses both CSIRO's establishment of guidance and supporting practices in regard to project planning and the extent to which the guidance is adhered to in practice.

Guidance and supporting practices for project plans— Recommendation No.3

Previous audit

The previous audit found that co-investment and consulting projects tended not to have comprehensive project plans. Instead, they relied on project proposals to clients to guide project implementation. These lacked elements such as project risk assessments and intermediate milestones.

Appropriation projects were not required to have a plan. Only a third of such projects had a plan, and only half had a budget.[13]

Recommendation No.3

The ANAO recommended that, in order to facilitate a more robust approach to project management, CSIRO develop guidance and supporting practices to ensure that projects have appropriate, documented and readily accessible implementation plans.

4.1   Implementation of this recommendation is still in progress. CSIRO has improved its guidance on project planning, but this guidance is not consistently adhered to.

New guidance on the use of project plans

4.2   CSIRO has now established guidance on the content and use of project plans. CSIRO policy requires all work to be managed in accordance with a project plan. The CSIRO Guide sets out in detail what should be included in the plans, as summarised in Figure 4.1.

---

[13]   ANAO Report No.51 2001–02, op. cit, paragraphs 4.4–4.12.

Figure 4.1

CSIRO requirements in regard to project plans

Project plans must specify:	Project plans must include:
• Objectives • Deliverables • Milestones • Customer • Budget (and other resourcing) • Business domain (output projects only) • Timeframe • Project structure (Project Leader). **Project plans must address:** • OHS&E assessment • Project risk assessment • Communication requirements.	• A process for how parties should interact and resolve issues when the project involves external customers, external collaborators and multiple divisions. • A Technology Transfer and Commercialisation Plan for projects with projected commercial outcomes, or Application Statement (as defined in the CSIRO Commercial Practice Manual) when it is too early to identify commercial outcomes.

Source: CSIRO Project Management Guide

Adherence to the new CSIRO policy

4.3   Overall, more projects have a plan than at the time of the previous audit. However, the ANAO estimates that only about half of consulting or co-investment projects have a separate plan.

4.4   As was the case at the time of the previous audit, where projects do not have a plan, the project proposal agreed with the external client is used as the basis for project management. This practice is not consistent with the CSIRO policy. In addition, their usefulness as a plan is limited as proposals tend not to contain:

• a project risk assessment; or

• identified critical paths and plans for the achievement of intermediate milestones. That is, milestones not subject for payment but nevertheless important for project success.

4.5   All appropriation projects examined by the ANAO included a plan. However, the ANAO identified that in some divisions the practice of developing plans for such projects was not yet universal.

4.6   CSIRO Policy requires that project plans address how parties should interact and resolve issues, and that the plans include either a Technology Transfer and Commercialisation Plan or an Application Statement (see Figure 4.1). The ANAO noted that these requirements were rarely complied with in plans examined.

4.7 The ANAO concludes that there remain a number of important aspects of CSIRO's new policy for the use of project plans that are not implemented in practice.

Enhancing project costing—Recommendation No.4

Previous audit

The previous audit found that CSIRO had procedures for costing co-investment and consulting projects. However, there was no requirement or guidance on costing appropriation projects and as a result many lacked a budget. The ANAO also found that indirect overheads were funded corporately and not passed to divisions, amounting to an additional contribution, or unplanned subsidy, to co-investment and consulting projects.[14]

Recommendation No.4

The ANAO recommended that CSIRO enhance its costing policies to provide clear policy and guidance on:

a) costing of appropriation projects; and

b) the distribution of corporate overheads to research projects.

Guidance on the costing of appropriation projects and distribution of corporate overheads

4.8 This recommendation has been implemented.

4.9 CSIRO has markedly expanded its guidance on costing projects, including appropriation projects. CSIRO Policy now states that *all* projects must have a budget and that project budgets should be based on estimates of full direct and indirect costs.

4.10 The guidance explicitly addresses the treatment of overheads. The CSIRO Policy and associated Guidelines specify that project budgets and financial reports should be based on full direct and indirect costs, including corporate and other overheads. In addition, CSIRO Policy now requires that all corporate and divisional support costs and overheads be attributed to projects to identify their full cost.

---

[14] ANAO Report No.51 2001–02, op. cit, paragraphs 4.15–4.21.

Adherence to the new guidance in practice

4.11   Both aspects of the new guidance are generally adhered to in practice.

4.12   The costing of appropriation projects has improved since the previous audit. All appropriation projects in the ANAO's sample had a budget.[15]

4.13   Requirements for the distribution of overheads are now met. Each division examined by the ANAO had a standard costing template, which was used for all projects to allocate overheads. All projects examined by the ANAO, including appropriation projects, had a fully costed budget that included divisional and corporate overheads.

4.14   Notwithstanding that there was general compliance with the costing policy, the way it was implemented varied between divisions. For example, different rates, or methods were used to allocate overheads. This created challenges for managing projects, such as Flagship projects, that crossed divisional boundaries.

4.15   CSIRO is addressing this issue by developing a Common Organisational Costing Framework which is expected to include:

- a standard costing spreadsheet for use by all divisions;

- a standard classification and definition of costs;

- a revised CSIRO-wide costing methodology; and

- implementation of a standard job-costing system.

4.16   CSIRO intends the framework to apply to all projects and be implemented by 30 June 2005.

---

[15]   However, as noted in paragraph 4.5, some appropriation activity was still being conducted without being defined as a project and therefore lacked a specific budget and associated visibility for monitoring.

Conduct of project risk assessments—Recommendation No.5

Previous audit

The previous audit found that the formal assessment and documenting of project risks was not required by CSIRO policy. None of the projects examined by the ANAO in the previous audit had a project risk assessment.[16]

Recommendation No.5

The ANAO recommended that project planning address project risk assessments and management to an agreed standard, including project delivery risks.

4.17   Implementation of this recommendation is still in progress.

New guidance on the conduct of project risk assessments

4.18   Since the previous audit CSIRO has enhanced its approach to project risk management. In contrast to the situation at the time of the previous audit, CSIRO Policy now requires all projects to have a risk assessment. CSIRO Policy states that projects should be managed 'in a manner that is commensurate with their size, complexity, sensitivity and associated risks'.

4.19   The CSIRO Guide also states that project plans must address project risk assessment and that during planning, staff should '…undertake a detailed Project Risk Assessment and integrate risk treatment strategies into the Project Plan'.[17] The Guide also encourages staff to undertake a preliminary risk assessment prior to preparation of a detailed project plan. Such preliminary assessments are consistent with better practice.

4.20   As noted at paragraph 2.11, CSIRO has developed additional guidance in the form of Project Risk Assessment Toolbox. The Toolbox includes definitions of key risk management terms; suggests a process for conducting project risk assessments; and includes a number of templates, such as for a project risk register. It particularly addresses the need to address risks to project delivery, as well as OH&S or contract risks.

4.21   To reinforce the importance of project risk management, CSIRO conducted some workshops on project risk management for project leaders during 2003. It also conducted training programs on risk assessment. Risk assessment has also been incorporated into the Project Management course.

---

[16]   ANAO Report No.51 2001–02, op. cit, paragraphs 4.30–4.38.

[17]   This is in addition to the contract risk assessment required when the project is for an external client.

Adherence to the new guidance in practice

4.22   Project risk assessments are now conducted more frequently than at the time of the previous audit. There are also areas of better practice, particularly in regard to the coordination of project risk assessments (see Figure 4.2).

Figure 4.2

Example of better practice in risk management

In one division, all project risk assessments are reviewed by a nominated divisional manager who examined the range of risks identified, their significance and their proposed treatments. This encouraged a more consistent approach to risk analysis, and encouraged a risk-aware culture in the division.

4.23   However, overall, only some half of projects examined by the ANAO had a documented project risk assessment. This is a substantial improvement compared to the previous audit, when no projects had such an assessment. However, compliance is uneven. As shown in Figure 4.3 the conduct of documented risk assessments varies markedly between the divisions examined in this audit.

Figure 4.3

Projects with a documented risk assessment—three divisions
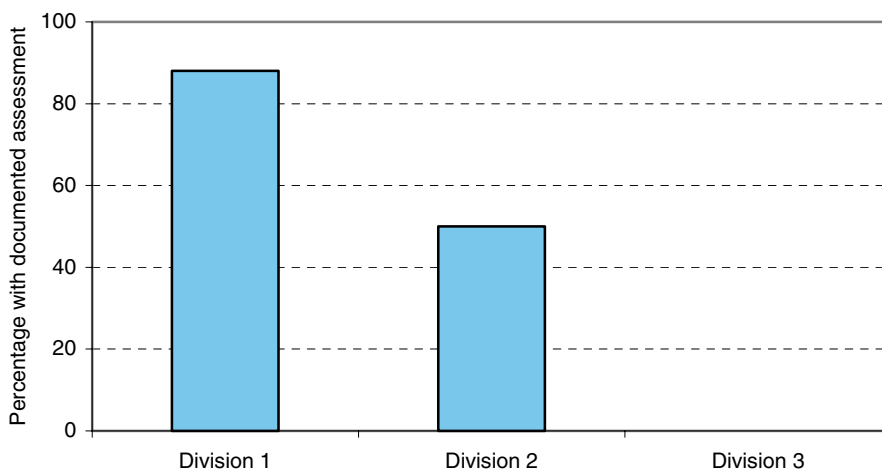
Source: ANAO

4.24   The low rate of documented project risk assessment is not meeting the requirements of CSIRO Policy. This appears to be due to a number of factors. These include:

- uncertainty as to whether the contract and OH&S risk assessments constituted a project risk assessment;

- a view that discussions of project risks need not be documented; and

- project leaders not seeing the risk assessment process as adding value.

4.25 In response, CSIRO acknowledged that compliance with the requirements for risk assessments was unsatisfactory. It advised that it was reviewing the conduct of risk assessments with the aim of developing a single, integrated approach to project risk assessment that addressed the various facets of risk.

5. Monitoring and Reviewing Project Performance

This chapter examines CSIRO's progress in implementing Recommendation Nos 6, 7 and 8 of the previous audit. It assesses the extent to which project monitoring is now well supported by guidance and management information, including information on the achievement of project milestones.

Managing scope change—Recommendation No.6

Previous audit

The previous audit found that processes to monitor changes to project scope and risks were not well documented, systematic or transparent, particularly for appropriation projects.[18]

Recommendation No.6

The ANAO recommended that CSIRO articulate standards and procedures for approving, managing and documenting scope change for projects.

5.1　　This recommendation has been implemented.

5.2　　At the time of the previous audit, CSIRO had no explicit guidance on managing project scope change. However, the CSIRO guidance now sets out how scope change is to be managed.

5.3　　CSIRO Policy requires that significant changes to the scope of a project must be approved by an Authorised Officer. The approvals must be supported with clear and accessible documented reasons. The Policy defines scope change as '…including changes in respect of the project objectives, deliverables, timeframes (milestones) and resourcing requirements'.[19]

5.4　　The CSIRO Guide supports the policy by identifying scope management throughout the life of a project as a part of project management. In addition, the Guide suggests procedures for managing change through a project's life. It suggests establishing clear change control procedures, including the use of change requests and change logs.

---

[18]　ANAO Report No.51 2001–02, op. cit, paragraphs 5.8–5.13.

[19]　The Project Management Guide goes on to state that 'Significant scope change' is a relative term that depends on the sensitivity or complexity of changes—whether they affect scientific, commercial or operational aspects of the project, the objectives, deliverables, timeframes (milestones) or level of resources required.

5.5   The ANAO examined the implementation of this policy and guidance. For projects examined, changes to project scope were appropriately documented and approved. Senior management advised that improved management of change in scope was also attributable to more transparent management of additional or 'spin-off work'. Staff are now encouraged to create a new project, rather than engage in an un-planned or un-approved expansion of an existing project, as tended to occur at the time of the previous audit.

Monitoring project costs—Recommendation No.7

Previous audit

The previous audit found that inadequate recording of project budgets in the Project Support System (PSS) reduced the capacity of CSIRO to monitor individual project costs effectively. The reliability of data on actual labour costs also varied widely, resulting in staffing costs recorded in PSS often being inaccurate. CSIRO's ability to monitor cost against budget for appropriation projects was limited by the practice of some divisions not recording budgets for these projects in PSS.

These deficiencies limited CSIRO's ability to monitor, identify and assess for action cost overruns. Around one-third of consulting projects exceeded their budget and there was substantial subsidisation from appropriation funds.[20]

Recommendation No.7

The ANAO recommended that:

a) CSIRO record on PSS budgets and the actual effort expended on projects, including for appropriation projects; and

b) develop procedures on the monitoring and funding of project cost over-runs.

Recording budgets and costs on PSS—Recommendation No.7(a)

5.6   Implementation of this part of the recommendation is still in progress.

Recording of budgets

5.7   Baseline budgets provide the benchmark for the monitoring of costs as a project proceeds. Current PSS functionality requires that a project baseline budget must be entered at the time of creating the project in PSS.

5.8   Since the previous audit, CSIRO has developed guidance on the recording of baseline budgets. This states:

> Project Leaders should document the baseline budget and supporting details as part of the Project Plan. If approved, the baseline budget should be entered on the Project Support System (PSS).[21]

---

[20]   ANAO Report No.51 2001–02, op. cit, paragraphs 5.22–5.38.

[21]   CSIRO Project Management Guide, p.35.

5.9   However, the ANAO found that this policy is not consistently followed. One-third of projects created since 1 January 2003 did not have an accurate baseline budget. The policy requirement had been circumvented by staff entering a budget of $0 or $1. This pattern of non-compliance is consistent across all types of projects.

5.10   The lack of adherence to corporate policy in this area limits management's ability to easily and efficiently monitor whether project budgets are being met. This is particularly important for appropriation and co-investment projects, which lack the clear profit benchmark used in consulting projects.

Recording of actual effort expended

5.11   The major expense in most research projects is labour cost. Since the previous audit, CSIRO has introduced a policy requiring staff to record in PSS their time spent on individual projects. This policy has been articulated and reinforced by guidance, including an Effort Logging Quick Reference Card.

5.12   CSIRO had a target of achieving effort logging by 95 per cent of staff by July 2003. However, as at June 2004, only 86 per cent of staff were effort logging. CSIRO advised the ANAO that, given the cultural change required, it considered 86 per cent compliance to be a significant achievement, notwithstanding its target.

5.13   CSIRO also advised that it will be seeking to increase the level of compliance through, for example, further promotion of the policy, communication and training. The ANAO notes that a greater level of effort logging is necessary to meet the aims of the proposed Common Organisational Costing Framework (see paragraph 4.15).

Procedures for monitoring and addressing project cost over-runs— Recommendation No.7(b)

5.14   Implementation of this part of the recommendation is still in progress.

5.15   The previous audit identified that nearly one-third of active consulting projects were exceeding their budget and were potentially subsidised by appropriation funds.[22] In 2001–02, the subsidy amounted to $30 million, or 30 per cent of consulting revenue.

5.16   Since the previous audit, CSIRO has put in place a number of initiatives to improve the monitoring and control of costs and to address this subsidisation.

---

[22]   Such overruns can either be met by commercial reserves created from surpluses on previous consulting projects, or from appropriation funds.

5.17   The CSIRO Guide now requires that, once a project is completed, the deficit or surplus should remain visible and the project closed in PSS. This is in contrast to the situation at the time of the previous audit, when recording practices tended to obscure a project's actual financial outcome. CSIRO has also developed a standard report to identify the financial performance of projects.

5.18   These initiatives have markedly improved the consistency and transparency of project costing, and the transparency of project cost over-runs, particularly for co-investment and consulting projects.

5.19   In addition, CSIRO's Strategic Plan has an objective of eliminating subsidisation in consulting services. Progress toward this objective is reported quarterly to the CSIRO Board. For 2003–04, CSIRO adopted a target of reducing subsidisation by 30 per cent during the year.

5.20   As Figure 5.1 shows, the subsidy of consulting projects in fact fell by over 60 per cent, to around $8.8 million in 2003–04.

Figure 5.1

CSIRO subsidy of consulting projects: 2001–02 to 2003–04
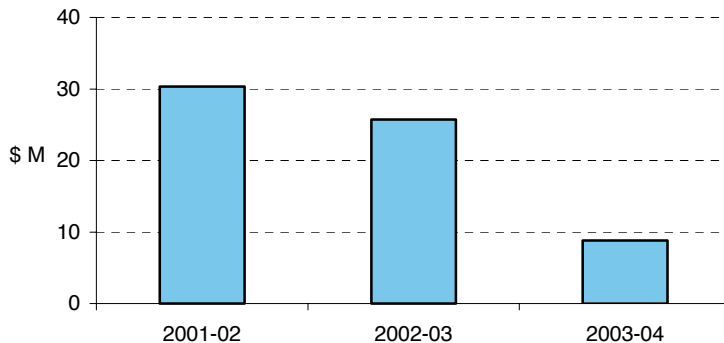
Source: ANAO analysis of CSIRO data

5.21   CSIRO advised the ANAO that elimination of the subsidy completely will take some time, as it is partly due to projects entered into before the new project management framework was established.

5.22   As discussed at paragraph 6.8, ANAO analysis indicates that recently commenced consulting projects are not subsidised.

Recording achievement of milestones— Recommendation No.8

Previous audit

The previous audit concluded that inadequate or inconsistent milestone data in key management information systems limited CSIRO's ability to monitor project timeliness. This was particularly the case for appropriation projects, whose milestones were usually not recorded at all in the PSS.[23]

Recommendation No.8

The ANAO recommended that achievement of milestones is recorded in relevant information systems.

5.23   This recommendation has not been implemented.

5.24   As was the case at the time of the previous audit, divisions are encouraged to enter milestone data into PSS, but this is not mandatory. As a result, data is held in a mix of corporate and divisional systems. Generally, only milestones for co-investment or consulting projects that attract a payment are recorded and monitored. The ANAO reviewed the milestone data available in PSS and found that data was in some cases incomplete.

5.25   There is currently no corporate system to track the achievement of milestones for appropriation projects.

5.26   CSIRO acknowledged that the quality of milestone data was not satisfactory and advised that the proposed Project Workflow system will require staff to record and track their achievement milestones for major projects. CSIRO plans to implement a milestone tracking and reporting capacity within the system by mid–2005.

5.27   Overall, the processes and systems for recording project milestones and their achievement have not changed since the previous audit.

5.28   If implemented and used appropriately, Project Workflow has the potential to improve the quality and quantity of data on milestone achievement through the life of the project. However, the inconsistency in the use of current systems highlights the need for CSIRO to support and monitor the appropriate use of any new system, and take prompt corrective action if necessary.

---

[23]   ANAO Report No.51 2001–02, op. cit, paragraphs 5.41–5.46.

Monitoring project risks

Previous audit

The previous audit found that review of project risks during the life of a project was informal and unstructured. In response CSIRO advised that a new computerised project risk management system would support a more systematic approach to risk monitoring and review.[24]

The ANAO did not make a recommendation because of CSIRO's advice.

5.29   CSIRO has improved its guidance on risk review. For example, the CSIRO Guide states that project leaders should monitor, review and report risks throughout the project lifecycle. The Project Risk Assessment Toolbox (see paragraph 4.20) also states that the project risk register should be regularly reviewed and, if necessary, updated.

5.30   However, the ANAO found that CSIRO has not implemented the proposed system for monitoring project risks, as it foreshadowed previously. It advised that this was due to competing priorities for IT system investment.

5.31   The ANAO also found that review of project risks remains relatively informal, occurring in the context of broader project review. Further, risk registers are rarely used to guide ongoing project management. The ANAO was advised that this was because staff considered they are able to adequately monitor and respond to risks as circumstances changed, without recourse to the risk register.

5.32   Regular review of risks is an accepted part of better practice in project management, as reflected in CSIRO policy. Nevertheless, there has been relatively limited improvement in monitoring of risks. This suggests that policies need to be supported by other management initiatives to facilitate implementation and compliance.

---

[24]   ANAO Report No.51 2001–02, op. cit, paragraphs 5.16–5.21.

6. Assessing Project Outcomes

This chapter examines CSIRO's progress in implementing Recommendation No.9 of the previous audit. It reviews CSIRO's approach to assessing project outcomes, including the use of project completion reviews.

Background

Previous audit

The previous audit did not directly assess the quality of scientific analysis by CSIRO. However, external reviewers and stakeholders considered CSIRO provided high quality scientific advice.

Limitations in the reliability of timeliness and cost data hampered CSIRO's ability to assess these outcomes for completed projects. However, analysis by the ANAO suggested costs were exceeding contracted revenue for many projects. Occasionally, appropriation funds had been used to fund overspends in consulting or co-investment projects. As well, project milestones were often met later than planned.

CSIRO had a policy of undertaking systematic post project review, with a focus on more 'significant' external projects. However, reviews were rarely conducted. This reduced CSIRO's ability to assess outcomes of individual projects and to identify lessons for management improvement. There was no requirement for appropriation projects to undergo such a review.[25]

Recommendation No.9

The ANAO recommended that, in order to maximise organisational learning from project management experience, CSIRO implement a systematic approach to project completion review that addresses the key aspects of project performance.

A systematic approach to project completion review— Recommendation No. 9

6.1 This recommendation has been largely implemented.

6.2 CSIRO Policy now requires *all* projects to undergo a project completion review (Figure 6.1).

---

[25] ANAO Report No.51 2001–02, op. cit, paragraphs 6.10–6.16.

Figure 6.1

CSIRO Policy on project completion reviews

Policy 6. On completion, all projects must be reviewed:

a)   to assess compliance with CSIRO project management and related policies; and

b)   to assess overall project performance (i.e. achievement of objectives and/or lessons learned).

The results of these reviews must be documented on file. Project reviews should be conducted in a manner appropriate to the scope and nature of the project and 'signed off' by the relevant Authorised Officer.

Source: CSIRO Project Management Policy

6.3   Supporting this policy, the CSIRO Guide suggests some issues to be addressed in such reviews. CSIRO has also developed a template for the reviews. The template sets out a number of criteria for assessing the project, including response to outputs, scientific benefits, adequacy of resourcing and lessons learned.

6.4   These criteria address most key aspects of project performance. However, the template does not explicitly ask project leaders to assess the extent to which project objectives were met. Doing so would be more consistent with better practice, and support a more direct focus on project achievements.

6.5   In practice, the conduct of project completion reviews is substantially greater than at the time of the previous audit. The ANAO examined a sample of seven closed projects and found that a formal project completion review had been conducted in all but one case. For the latter, CSIRO advised that a review had not been conducted due to competing priorities. However, a discussion of project outcomes had occurred at a team de-brief.

6.6   Divisions still adopt varying practices for project completion reviews. Although two of the divisions examined use the standard corporate template, practice varied in the type and detail of information recorded. The other division used its own template, which also sought different information.

6.7   These variations reduce the potential contribution of such reviews to organisational learning and management review. Greater consistency in the focus and content of post project reviews would provide additional assurance that project outcomes were appropriately assessed, for the benefit of management and stakeholders.

Project outcomes achieved

Previous audit

The previous audit found that costs were exceeding contracted revenue for many projects. Appropriation funds had been used to fund overspends in consulting or co-investment projects. Overall, consulting projects made a loss. As well, project milestones were often met later than planned.

The ANAO suggested that the funding of consulting projects and timeliness of project completion in general, merited close management attention (paragraphs 6.32 and 6.35 of the previous report).
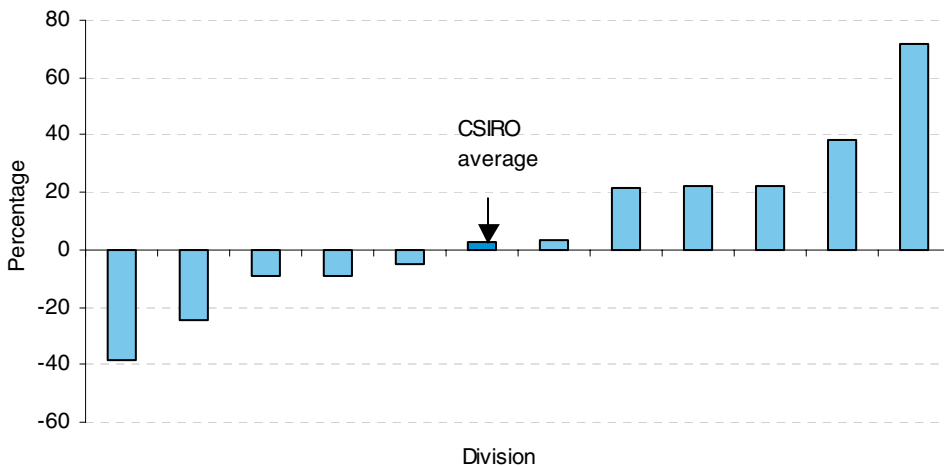
Cost outcomes

6.8   For this audit, the ANAO analysed the returns achieved for 87 completed consulting projects started after the CSIRO Policy and Guide on project management came into effect. This analysis indicated that the projects generated a positive return of 2.6 per cent. This compares with an overall loss for such projects at the time of the previous audit.

6.9   However, there was substantial variability in returns achieved. Some divisions made substantial losses (see Figure 6.2).

Figure 6.2

Returns on 87 closed consulting projects started after 1 January 2003, by division

Source: ANAO analysis of CSIRO data
Note: Some divisions did not complete consulting projects in the relevant timeframe. Data are only available for 11 of the 21 divisions.

6.10   The ANAO also examined cost outcomes for 63 closed appropriation or co-investment projects. These were projects that had started since the new policy guidance was implemented, and that had a substantive baseline budget in PSS. Analysis indicated that:

- of 21 appropriation projects examined, costing $1.27 million in total, 16 were completed under budget and 5 were over budget; and

- of 41 completed co-investment projects, costing $1.65 million in total, 20 were completed under budget and 21 were over budget.

6.11   Overall, for both appropriation and co-investment projects examined, total costs were less than total budgeted expenditure.

Timeliness outcomes

6.12   The ANAO examined data on the timeliness of project completion for projects that had been created since establishment of the new project management framework.[26] This analysis was limited by the varying quality of data held on relevant management information systems, discussed previously at paragraph 5.24.

6.13   Figure 6.3 shows the extent to which projects were completed on time, for some 200 projects started and finished during this period. Data was not available for nine divisions. Ninety-seven of the projects examined (or 46 per cent) were completed on time. A further 51 (24 per cent) were completed within 30 days of the expected date. There were 61 projects (30 per cent) that were more than 30 days late.

6.14   In this context, the ANAO notes that feedback from customer surveys, discussed at paragraph 6.18, indicates that CSIRO is ranked 'average' in its ability to keep to schedule (see Table 6.1).

---

[26]   Comparable analysis with CSIRO's performance at the time of the previous audit is not possible. Data available from CSIRO data systems at that time was not sufficiently reliable.

Figure 6.3

Timeliness (days late) for recent projects: by division
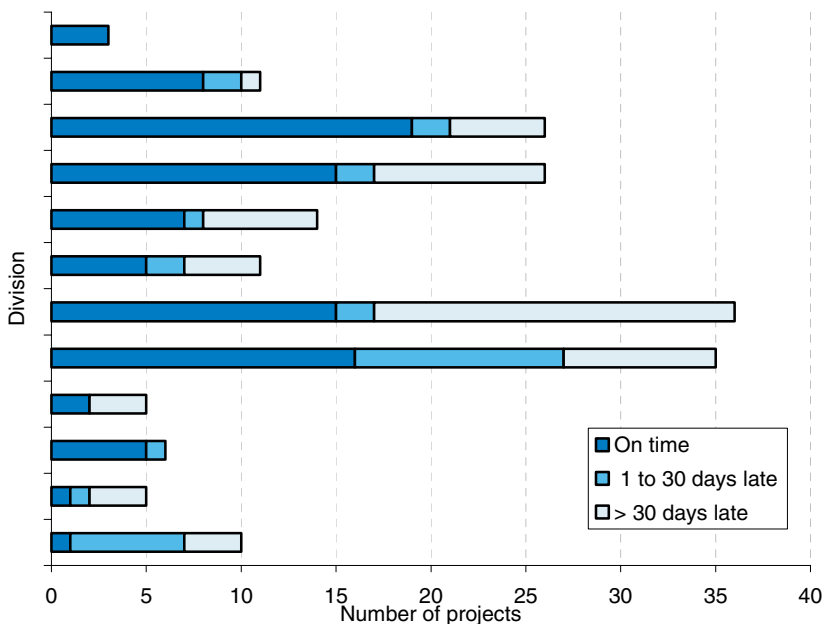
Source: ANAO analysis of CSIRO data
Note: Projects were started and completed between 1 January 2003 and 1 April 2004. Data are only
          available for 12 of the 21 divisions.

Scientific outcomes

6.15 As was the case with the previous audit, the ANAO did not directly seek to assess the scientific quality of CSIRO's research. However, some indication of quality is available from findings from customer surveys. These show CSIRO customers ranked it highly for its 'rigorous scientific approach' and 'quality' (see Table 6.1).

6.16 The ANAO also examined post project reviews for a small number of projects, for insights into scientific quality. The reviews are conducted by project staff and are thus not independent. Indicative comments included:

- '…the document was reviewed and approximately 90 per cent of indicators are being used for whole of government policy planning…external technical review took place and was also very positive';

- '…recognition of [division] being at cutting edge';

- '…no science benefit, done as favour to collaborator…not a winner, no science no money';

- '…we developed some acute meal studies enhancing our armamentarium of techniques'; and

- '…project was not highly original scientifically but useful to client '.

6.17 These comments reflect a positive view by CSIRO staff of its scientific innovation. Those projects that were less innovative scientifically were nevertheless seen as useful to the client and of appropriate quality.

Customer perspectives

6.18 The previous audit found that customer satisfaction data was not collected and used consistently across CSIRO. CSIRO has addressed these shortcomings. It has implemented a new approach to customer satisfaction, known as the 'Customer Value Survey'. The Survey is collected each quarter and seeks customer views on project delivery on a number of criteria.

6.19 Some results of the Survey are summarised in Table 6.1. They indicate that CSIRO is rated highly on its scientific rigour but less well on its price and keeping to schedule. These findings reinforce the need for CSIRO to have robust and efficient project management processes that facilitate delivery in a timely, cost-efficient manner.

Table 6.1

Average customer scores and rankings across CSIRO for selected attributes of project delivery

Attribute	Customer Score	Ranking
Competitiveness of the price	6.0	Below average
Rating overall on price	6.3	Below average
Providing integrated expertise from across CSIRO	6.7	Below average
Keeping to schedules	6.9	Average
Rating overall on quality	7.4	Above average
Extent to which deliverables meet expectations	7.5	Above average
Using suitable facilities and equipment	8.0	World Class
Using rigorous scientific approach	8.3	World Class

Source: CSIRO Customer Value Survey
Note: Ranking assessed by survey company. Score out of 10.

Canberra ACT
19 October 2004

Oliver Winder
Acting Auditor-General

Appendices

Appendix 1: CSIRO Project Management Policy

The following policy statements were issued on 18 December 2002 as part of the CSIRO Policy Circular on Project Management (PC2002/25) and encapsulate:

- Project management policies in the Commercial Practice Manual (Project Management section)
- Management by Project Policy Circular (PC2002/01) issued in February 2002.

The policies are effective from 1 February 2003.

Policy 1.   All work in CSIRO regardless of fund source must be managed on a project basis in accordance with a Project Plan.

Policy 2.   All Project Plans must accord with the CSIRO Strategic Plan, the relevant annual Operational Plan and relevant budgetary allocations.

Policy 3.   Project Plans, and significant changes to the scope of a project, must be approved by an Authorised Officer and such approvals must be supported with clear and accessible documented reasons. Projects should not commence until the Project Plan has been approved.

Policy 4.   Projects must be managed by a Project Leader appointed by an Authorised Officer. The Authorised Officer must ensure that people engaged in the management of Projects (i.e., Project Leaders) have the appropriate skills.

Policy 5.   Project Leaders must be accountable to the Authorised Officer who approved the Project (and their respective supervisors) to ensure that:

a. projects are planned, approved and monitored to ensure delivery of agreed objectives within the approved budget;
b. CSIRO management systems contain reliable and complete data about their Projects;
c. projects comply with CSIRO project management and related policies; and
d. projects are managed in a manner that is commensurate with their size, complexity, sensitivity and associated risks.

Policy 6.   On completion, all Projects must be reviewed:

> a. to assess compliance with CSIRO project management and related policies; and
> b. to assess overall project performance (i.e.: achievement of objectives and/or lessons learned).
>
> The results of these reviews must be documented on file. Project reviews should be conducted in a manner appropriate to the scope and nature of the project and 'signed off' by the relevant Authorised Officer.

Policy 7.   Project budgets and financial reports should be based on full direct and indirect costs, including corporate and other overheads.

> i. All corporate and Divisional Support Project costs and overheads should be attributed to Output Projects to identify their full cost. Attribution of such costs should be made in accordance with specific guidance as issued from time to time.
>
> ii. For management purposes, units should be able to identify the full cost of Support Projects. However, the revenue and costs of Support Projects must eventually be allocated to Output Projects.

Policy 8.   Learning and development programs for staff members should support and give effect to these policies.

The above policies must be read in the context of the following Policy Definitions.

Project management policy definitions

a.   Project Definition

To ensure proper accountability and to facilitate their effective use, all resources in CSIRO are managed through Projects. Projects are of two types: Output Projects and Support Projects.

Projects should be defined in terms of specified and approved:

- Objectives—that are consistent with the CSIRO Strategic Plan and relevant annual Operational Plan
- Deliverables—describing the outputs (products/services) to be delivered to the customer

- Milestones—describing important landmarks for project management, reporting and invoicing, and that signify whether the project is 'on track' to deliver its deliverables and achieve its objectives in a timely fashion
- Customer—internal or external
- Budget
- Business Domain—each output project will reside in a single business domain (CSIRO Investment Model)
- Timeframe—beginning and end. Projects for administrative and research support functions may be defined in terms of annual or triennial review dates, rather than a beginning and end date.
- Project Leader

Contracts with external customers must be managed as separate projects, except high volume, low price per service routine technical and consulting services which may be managed as a single project.

- For example: Technical services include routine testing, calibration and analytical services. Consulting services involve scientific or technical advice to customers based on existing knowledge, not new research. Major consultancies and research contacts should be managed as discrete projects.

Projects should be categorised as:

i. Output projects:

  - Projects which contribute to the outputs delivered to the Government, as specified in the CSIRO Strategic Plan and relevant annual Operational Plan.

ii. Support projects:

  - Projects to manage support activities and indirect costs.

In each category Divisional and Corporate Projects shall be separately identified.

b. *Project Plan*

Consistent with the above definition of a Project, project plans must specify:

- Objectives
- Deliverables
- Milestones
- Customer

-   Budget (and other resourcing)
-   Business domain (Output projects only)
-   Timeframe
-   Project structure (Project Leader)

Project plans must address:

-   OHS&E assessment
-   Project risk assessment
-   Communication requirements

Project plans must include:

-   A process for how parties should interact and resolve issues, when the project involves external customers, external collaborators and multiple Divisions.

-   A Technology Transfer and Commercialisation Plan for projects with projected commercial outcomes <u>or</u> when it is too early to identify commercial outcomes an Application Statement (as defined in the CSIRO Commercial Practice Manual).

c.   *Significant scope change*

'Scope change' includes changes in respect of the project objectives, deliverables, timeframes (milestones) and resourcing requirements.

'Significant scope change' is therefore a relative term that depends on the sensitivity or complexity of changes—whether they affect scientific, commercial or operational aspects of the project, the objectives, deliverables, timeframes (milestones) or level of resources required.

d.   *Authorised Officer*

Authorised Officer means a person appointed in accordance with the CSIRO Authorities Manual.

Appendix 2: Topics addressed in the CSIRO Project Management Guide

POLICY

1.   Project Management Policy Statements

2.   Related Policy Statements

PROCEDURES

3.   Financial Management By Project

GUIDELINES

4.   Project Management Structure

5.   Project Management Framework

6.   Scope Management

7.   Work Breakdown Structure

8.   Resource Management

9.   Financial Management

10.   People Management

11.   Occupational Health, Safety And Environment

12.   Records Management

13.   Communications And Relationship Management

14.   Commercial And Contract Management

15.   Performance Management

16.   Quality Management

17.   Risk Management

18.   Issues Management

19.   Project Selection And Approval

20.   Change Control

SUPPLEMENTARY INFORMATION

A: Description Of Roles And Responsibilities

B: Technology Transfer & Commercialisation Plan—Application
         Statement

C: Work Breakdown And Scheduling Techniques

D: Divisional And Customer Guidelines

Appendix 3: Full response to the audit from CSIRO.

CSIRO welcomes this *Follow-up* audit by ANAO to Audit Report No.51 of 2001–02*, Research Project Management—CSIRO.* Improving project management is a strategic objective of CSIRO and we are pleased that ANAO has found that, overall our management of research projects has improved over the past two years, particularly in the following areas:

- Development of project management framework and business rules

- Significant improvement in the management of appropriation projects

- Demonstrated strategic alignment of projects to divisional plans

- Better costing of projects and monitoring and control of costs, and distribution of corporate overheads (resulting in significant reduction in subsidisation of consulting and testing projects)

- Management and documentation of project scope changes

- Project completions reviews

We believe that this improvement will continue as project management skills further develop and mature across the Organisation and project management practices become embedded as part of our everyday business operations. We recognise that requires a significant cultural change and that support through staff training and development, clear policy and guidelines and effective and efficient support systems are all essential.

Further initiatives, either currently in progress or planned for the short term, will contribute to continuing improvement in this area. In addition to addressing business needs, the following initiatives will address incomplete matters raised by ANAO in the initial audit and suggestions raised in this follow-up audit:

- Proposed changes to our project management policy to take account of issues identified in this report relating to an appropriate framework for small scale work and ongoing operations; i.e. we will specifically recognise through policy and guidelines that low risk 'minor' projects and 'ongoing operations' require a 'lighter' approach to project management than 'major' projects.

- More emphasis on monitoring the implementation of some areas of our project management policy to improve the accuracy and use of data in our corporate systems. We agree that the current situation needs improving. Recently a set of measures has been developed which will be used by Group Executives and Divisional Management to take an

active role in improving compliance, monitoring and use of project management data in corporate systems.

- A planned review of the Organisation's risk management framework covering projects, commercial operations and OHS&E with harmonisation and simplification where possible. We believe that a reason for some relatively poor policy compliance in relation to project risk assessments is that project managers currently need to undertake separate risk assessments to comply with policy in the three areas mentioned above. A more integrated approach reducing duplication and simplifying the process will assist greatly in embedding risk assessment and management processes within our project work.

- Implementation and mandatory use of the Project Workflow system which directly supports our project management framework. The system will encourage standard processes across the Organisation and incorporates functionality that will address several of the issues identified by the ANAO, including a) the current deficiency in the area of capturing and reporting project milestone details, and b) a consistent approach to the documentation, accessibility and use of project plans across CSIRO.

- As part of a strategic project aimed at developing an 'Enterprise Portfolio Investment Strategy' CSIRO will consider and address the need for 'systematic processes based on specific criteria' for project selection as was recommended in the initial Audit report. CSIRO believes its divisions currently undertake appropriate due diligence in relation to project selection.

- To address the cultural change issue CSIRO will continue to run training courses in project management and amongst other things will consider whether some form of accreditation is appropriate before appointing staff to project manager positions.

Implementation of the above change program should ensure that CSIRO is recognised as a performance oriented enterprise with sound project management practices.

Index

Series Titles

Audit Report No.11 Performance Audit
Commonwealth Entities' Foreign Exchange Risk Management
Department of Finance and Administration

Audit Report No.10 Business Support Process Audit
The Senate Order for Departmental and Agency Contracts (Calendar Year 2003 Compliance)

Audit Report No.9 Performance Audit
Assistance Provided to Personnel Leaving the ADF
Department of Defence
Department of Veterans' Affairs

Audit Report No.8 Performance Audit
Management of Bilateral Relations with Selected Countries
Department of Foreign Affairs and Trade

Audit Report No.7 Performance Audit
Administration of Taxation Rulings Follow-up Audit
Australian Taxation Office

Audit Report No.6 Performance Audit
Performance Management in the Australian Public Service

Audit Report No.5 Performance Audit
Management of the Standard Defence Supply System Upgrade
Department of Defence

Audit Report No.4 Performance Audit
Management of Customer Debt
Centrelink

Audit Report No.3 Business Support Process Audit
Management of Internal Audit in Commonwealth Organisations

Audit Report No.2 Performance Audit
Onshore Compliance—Visa Overstayers and Non-citizens Working Illegally
Department of Immigration and Multicultural and Indigenous Affairs

Audit Report No.1 Performance Audit
Sale and Leaseback of the Australian Defence College Weston Creek
Department of Defence

Better Practice Guides

Fraud Control in Australian Government Agencies	August 2004
Security and Control Update for SAP R/3	Jun 2004
AMODEL Illustrative Financial Statements 2004	May 2004
Better Practice in Annual Performance Reporting	Apr 2004
Management of Scientific Research and Development Projects in Commonwealth Agencies	Dec 2003
Public Sector Governance	July 2003
Goods and Services Tax (GST) Administration	May 2003
Managing Parliamentary Workflow	Apr 2003
Building Capability—A framework for managing learning and development in the APS	Apr 2003
Internal Budgeting	Feb 2003
Administration of Grants	May 2002
Performance Information in Portfolio Budget Statements	May 2002
Life-Cycle Costing	Dec 2001
Some Better Practice Principles for Developing Policy Advice	Nov 2001
Rehabilitation: Managing Return to Work	Jun 2001
Internet Delivery Decisions	Apr 2001
Planning for the Workforce of the Future	Mar 2001
Contract Management	Feb 2001
Business Continuity Management	Jan 2000
Building a Better Financial Management Framework	Nov 1999
Building Better Financial Management Support	Nov 1999
Managing APS Staff Reductions (in Audit Report No.49 1998–99)	Jun 1999
Commonwealth Agency Energy Management	Jun 1999
Cash Management	Mar 1999

Security and Control for SAP R/3   Oct 1998

Selecting Suppliers: Managing the Risk   Oct 1998

New Directions in Internal Audit   Jul 1998

Controlling Performance and Outcomes   Dec 1997

Management of Accounts Receivable   Dec 1997

Protective Security Principles
   (in Audit Report No.21 1997–98)   Dec 1997

Public Sector Travel   Dec 1997

Audit Committees   Jul 1997

Management of Corporate Sponsorship   Apr 1997

Telephone Call Centres Handbook   Dec 1996

Paying Accounts   Nov 1996

Asset Management Handbook   Jun 1996