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Audit Report No. 11, 2000–2001

Knowledge System Equipment Acquisition Projects in Defence

Department of Defence

Introduction

Background

5.1 Defence's military and administrative information systems combine to form the Defence Information Environment (DIE) and are known as knowledge systems. Australian Defence Force (ADF) command and control depend on a wide range of information and administrative system technologies to assist the analysis of requirements, allocation of resources, integration of effort, management of logistics and coordination, and monitoring of ADF behaviour. Defence's total knowledge system consists of a vast 'system of systems'. It is necessarily decentralised across all Defence outputs but it needs centralised management to preserve system integrity and maximise synergies.

5.2 Effective use of information is vital to Australia's defence capacity. The Government's national defence policy identifies the highest capability development priority as 'the knowledge edge' so Australia may use its relatively small force to maximum effectiveness. The knowledge edge depends on effective

exploitation of intelligence and surveillance capabilities, communications, information warfare, command and headquarters systems, logistic and business applications, as well as on command and control structures and decision processes.[1]

5.3 On 1 July 2000, Defence appointed a Chief Knowledge Officer to manage the Defence information environment in a holistic approach to knowledge edge development.[2] However, many knowledge system elements now in service were selected prior to this appointment, on the basis of individual functionality and not on the basis of their architectural compliance with the broader system of systems.

> There is little information collated centrally about these systems because, for decades, Defence's various functional groups decided on, and funded, their administrative systems to suit their own purposes.…Defence records indicate there are some 150 different systems in the logistics organisations alone.[3]

5.4 Defence is pursuing the knowledge edge by investing extensively in knowledge system acquisition projects. Approved and planned projects that will have a substantial impact on the DIE have a total estimated value of almost $8.5 billion.[4] Under the Defence Capacity Plan, the Government anticipates it will spend about $1.3 billion per year on the maintenance of its information capabilities.[5] While the Chief Knowledge Officer is not the sponsor of all these new projects, nevertheless Defence now requires that every new project is examined by the Defence Capability Investment Committee, of which he is a member.[6]

Scope of audit

5.5 In Audit Report No. 11, 2000–2001, *Knowledge System Equipment Acquisition Projects in Defence*, the audit objective was:

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1 Department of Defence, *Defence 2000—Our Future Defence Force*, Commonwealth of Australia, October 2000, pp. 55, 94-95.

2 Defence, Submission no. 3, p. 1.

3 ANAO, Report No. 11, 2000–2001, *Knowledge System Equipment Acquisition Projects in Defence*, 15 September 2000, p. 25.

4 ANAO, Report No. 11, 2000–2001, p. 13.

5 Dept of Defence, *Defence 2000*, p. 97.

6 P Nicholson, *Transcript*, 2 March 2001, p. 23.

- to assess Defence's arrangements for higher-level management of its knowledge system projects and their coherence with Defence's other knowledge systems; and
- to provide a degree of assurance about its ongoing capacity for efficient and cost-effective management in this area.

5.6 The focus of the audit was on Defence's strategic-level management of equipment acquisition projects which relate to the development of Defence's knowledge edge and its ability to adopt a much more coherent and integrated approach to knowledge systems management prospectively rather than just emphasising current system compatibility issues.[7]

Audit findings

5.7 ANAO found that Defence's new arrangements for a Chief Knowledge Officer, supported by revised governance and accountability arrangements, is establishing the processes needed for effective program management of the $4.5 billion in knowledge system projects that he sponsors. The Chief Knowledge Officer thus becomes Defence's chief representative on knowledge system development matters in terms of setting direction and ensuring proper progress is achieved. The Vice Chief of the Defence Force and the former C[4]ISREW [8] organisation form part of an Owner Support Executive, which 'support the governance role, and are focused on Government and its role of owner of the enterprise rather than as a customer'.[9]

5.8 The situation is much less clear for the many other projects, estimated to cost some $4 billion, that will contribute to, or depend on, the DIE. ANAO believes that existing processes are not sufficiently robust to allow the Chief Knowledge Officer to scrutinise all relevant projects and, where appropriate, to challenge a perceived lack of coherency between projects and the DIE.[10] Institutional, organisational and procedural difficulties in Defence remain and these need to be overcome if Defence is to achieve total integration and smooth communication.

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7 ANAO, Report No. 11, 2000–2001, pp. 25–26.

8 **C[4]ISREW** stands for 'command, control, communications, computers, intelligence, surveillance, reconnaissance, and electronic warfare'. ANAO, Report No. 11, 2000-2001, p. 24.

9 ANAO, Report No. 11, 2000-2001, p. 31.

10 ANAO, Report No. 11, 2000–2001, p. 46.

5.9 ANAO maintained that from an information coherency perspective, Defence's business systems are the area of greatest concern to the Chief Knowledge Officer. Business and other administrative systems assist in financial, personnel, logistics and information management functions. Defence uses some 150 different logistics systems and many personnel and administrative information management systems. Business processes allow managers to acquire information systems to satisfy their individual functional requirements. As a consequence, the degree of commonality and ability to exchange information between these systems are limited.[11]

5.10 Defence is adopting a Standard Project Management Method (SPMM) for some 200 major equipment acquisition projects. However, progress to date indicates that not all acquisition projects have been converted to SPMM yet. Moreover, there appear to be problems in achieving effective application of the SPMM.[12] ANAO concluded that some action may be warranted not only to ensure that SPMM in Defence does not come in too many variations, but also to remove any confusion about the role of SPMM and any associated Project Boards, Integrated Product Teams, Integrated Acquisition Teams and Integrated Project Teams.[13]

5.11 The military and civilian workforce that supports the DIE is spread across a wide range of projects and endeavours. Shortages of skills in one area are addressed by denying essential skills to another. The DIE is therefore vulnerable to shortages in staff with the appropriate skills and experience. Statistics indicate that the three Services encounter difficulties in recruiting and retaining the skilled personnel needed to support the DIE.[14]

5.12 ANAO made seven recommendations designed to address these issues. Defence agreed to all the recommendations except Recommendation 7, which it accepted with qualification. Recommendation 7 focused on a holistic approach to the training and professional development of DIE staff, following a formal workforce planning and assessment. The Secretary of the

11 ANAO, Report No. 11, 2000–2001, p. 48.

12 As at April 2000, for example, there were 64 acquisition projects subject to the SPMM but only two of these were assessed as controlling their projects well using the SPMM. ANAO, Report No. 11, 2000–2001, p. 52.

13 ANAO, Report No. 11, 2000–2001, p. 53

14 ANAO, Report No. 11, 2000–2001, p. 55.

Department has indicated that aspects of the audit report would serve as action statements in this area for Defence.[15]

5.13 The Committee examined the following issues at its public hearing on Friday 2 March 2001:

- Defence's Knowledge Systems;
- The Role of the Chief Knowledge Officer
  - ⇒ Included projects
  - ⇒ Excluded projects
  - ⇒ Defence Capability Investment Committee
- Integration Authority
- Standardised Project Management Method (SPMM);
  - ⇒ New acquisition methods;
- DIE staffing profiles.

Defence's Knowledge Systems

5.14 At the public hearing, Defence acknowledged that considerable data, potentially useful to various groups in the organisation, was already collected. It is aware that its data needs to be developed and shared in a coherent and integrated manner with all organisational areas with legitimate needs for the data.[16] This need for better coherency between information systems is particularly so in respect of data in Defence's various administrative systems. Much of that data is collected at considerable cost but accessible only by personnel with detailed knowledge of, and experience with, a particular system and application.[17] As ANAO emphasised in its report:

> …each of the three Services has specialised electronic warfare systems that relate to specific platforms and weapons systems, but often do not account for the increasingly joint nature of military operations. Defence has recognised this by initiating a force-level electronic-warfare project, known as Project Bunyip, as a first step to

15 Defence, Submission no. 3, p. 4.

16 Nicholson, *Transcript*, 2 March 2001, p. 21.

17 ANAO, Report No. 11, 2000–2001, p. 29; Nicholson, *Transcript*, 2 March 2001, p. 22.

> overcoming the segmentation and limited inter-operability of current capabilities in this area.[18]

5.15 Defence said that the biggest problems with information integration and cohesion relate to its administrative programs:

> Because they have been developed in a stovepipe to fulfil a particular function. For example, there is a system called ROMAN, which is designed for a financial system but not designed to exchange information necessarily with the personnel system, which is called PMKEYS. So a lot of our work at the moment is to in fact enable that to take place. Each of these projects was conceived to fulfil the information requirements of a particular business process, say personnel.[19]

5.16 The main problem is the inability of specific functional areas to transmit information from one area to another—such as from the financial system to the personnel system or the logistics support system. One of the first integration moves under the new architecture will be the changes being made to the personnel system so that its chart of accounts can interact with the financial system's.[20]

5.17 This inability to communicate electronically became most obvious during the East Timor deployment. Defence told the Committee that:

> The magnitude of the problems were that many of those sorts of things could not be tracked electronically in the way they would be tracked in barracks electronically. We are working to actually provide that sort of information for deployed forces through a concept which we are calling the Defence management support environment.[21]

5.18 Defence went on to say that the consequences of not being able to track the information were 'inefficiency, more than anything else'.

> It took longer to do things. There were no show-stopping operational aspects in those failures, because there were manual systems in place, and we put in place interim

18 ANAO, Report No. 11, 2000-2001, p. 42.

19 Nicholson, *Transcript*, 2 March 2001, p. 22.

20 Nicholson, *Transcript*, 2 March 2001, p. 27.

21 Nicholson, *Transcript*, 2 March 2001, pp. 20–21.

> electronic systems for the operations. But we recognised that this should be a standing part of our business.[22]

5.19 In effect, Defence patched together an intranet so that commanders could track personnel movements, produce deployment planning sheets and track logistics. However, as Defence told ANAO, 'even where the systems were physically compatible, substantial work would be required before the information could usefully be shared'.[23] ANAO concluded that the East Timor experience confirmed the need for the Chief Knowledge Officer to scrutinise Defence's business and other administrative systems and assess their coherency with the DIE.[24]

5.20 As the Chief Knowledge Officer confirmed:

> The main problem is coherency between those systems—in particular, not being able to exchange information between the systems. We are working to overcome that now by, in the first place, recognising that administrative systems, which we have in the past have considered to be non-operational, are in fact integral to our operations, and that is this concept of the Defence management support environment. The second way to do that is to put in place a very rigorous governance mechanism to make sure that all projects that come under this administrative rubric are in fact examined for their coherency within the environment.[25]

5.21 While the Committee agrees, it cautions that improved coherency between information systems and projects should not be an end in itself. The main outcome should be the enhanced ability of front-line personnel, under central military command, to apply military force with precision and in a timely manner under a wide range of possible circumstances.

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22 Nicholson, *Transcript*, 2 March 2001, p. 21.

23 ANAO, Report No. 11, 2000-2001, p. 48.

24 ANAO, Report No. 11, 2000-2001, p. 49.

25 Nicholson, *Transcript*, 2 March 2001, p. 21.

The Role of the Chief Knowledge Officer

5.22 Projects sponsored[26] by the Chief Knowledge Officer are under 'fairly tight control' through the specified requirements that need to be met.[27] The sponsorship ensures that technical decisions which may affect the DIE's integrity and coherence are addressed in the wider context of the knowledge edge. As explained by ANAO in its report:

> The new arrangements will help make clear that, during acquisition, the Chief Knowledge Officer is the customer for projects that he sponsors. When acquisition is complete, responsibility for management of the products accepted into service will pass [from the Chief Knowledge Officer] to the Output Executives. It will also help to reduce the hiatus associated with moving a project from proposal to acquisition and on into service.[28]

Included projects

5.23 An example of a sponsored project discussed at the public hearing was JORN. The Chief Knowledge Officer is sponsoring a project to put improved software into JORN after it is delivered. He maintains a watch on the JORN software until it is delivered to the system which the Chief of Air Force actually operates. During this period the Chief Knowledge Officer defines requirements such as:

> …the period of operations that we will need to be able to run the radar, the extent of the range of surveillance, the number of tracks that we might want to detect at any one time and, broadly, how we want to use the radar in terms of overall Defence capability. The Chief Knowledge Officer decides that through the investment analysis processes that we have. When they are agreed, those requirements are handed to [the Electronic Systems Division] in the case of JORN.[29]

5.24 The Electronic Systems Division is accountable for delivering a JORN system which is consistent with the requirements set by the

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26 These are listed in Appendix 1, ANAO, Report No. 11, 2000-2001, p. 61.

27 R McNally, *Transcript*, 2 March 2001, pp. 23, 29.

28 ANAO, Report No. 11, 2000-2001, p. 50.

29 S McKinnie, *Transcript*, 2 March 2001, p. 29.

Chief Knowledge Officer who is kept informed about any areas where software may not be able to meet capability. Depending on the extent of the problem, the Chief Knowledge Officer will decide what is acceptable. If it is a major capability issue, it will be referred to the Defence Capability Investment Committee for consideration of acceptability and a decision on the type of action to be taken.[30]

Excluded projects

5.25 In contrast, Defence told the Committee that the Chief Knowledge Officer does not have any responsibility for the combat control systems on the Collins submarines—'primarily because that system is an integral part of the platform' and was in place before the Chief Knowledge Officer was appointed.[31]

5.26 When the Committee asked how the Collins submarines were going to interact with the rest of the knowledge system in Defence, Defence responded:

> As far as its ability to communicate outside to the Defence information environment is concerned, it has a communications suite which was specified to be able to interface with various parts....That was not designed to a communications architecture, which is the way we are now doing business; it was designed the way the sponsor thought he would operate the submarine at the time of specification.[32]

5.27 Among other large approved major projects which impact on the DIE but which are not sponsored by the Chief Knowledge Officer are the Airborne Early Warning and Control (AEW&C) project (AIR 5077)—whereby four AEW&C aircrafts will be acquired, with a further three later in the decade—and the Rotary Wing for Land Force project (AIR 87)—whereby two squadrons (20-24 armed reconnaissance helicopters) are planned to be operational from 2004–5.[33]

5.28 ANAO indicated that, in addition, minor capital projects that cost less than $20m each or that do not have identified implications for

30 McKinnie, *Transcript*, 2 March 2001, p. 29.

31 Nicholson, *Transcript*, 2 March 2001, pp. 29, 30.

32 Nicholson, *Transcript*, 2 March 2001, p. 30.

33 ANAO, Report No. 11, 2000-2001, p. 61; Defence, Defence 2000, pp. 82, 86.

Defence policy or for the joint Services are also excluded from the sponsorship of the Chief Knowledge Officer. Most of these projects are initiated by the three Services yet each Owner Support Executive does not have a detailed watch over the relevant projects. Many technical decisions taken in these projects can have serious impact on the DIE integrity and coherence—if not immediately then perhaps later on. As ANAO commented: 'Cutting corners on DIE coherence is a temptation to project managers under time and cost pressures and must be avoided through adequate managerial control'.[34]

Defence Capability Investment Committee

5.29 In effect, the Chief Knowledge Officer is only 'the guardian of the environment'[35] since he does not sponsor all Defence projects and he does not own any systems.[36] Instead, the Defence Capability Investment Committee, chaired by the Vice Chief of Defence Force, tries to ensure that new projects outside the Chief Knowledge Officer's sponsorship are compatible, meet the same criteria that are needed for knowledge systems, and accord with the DIE architecture. The highest level compatibility is virtually complete. The next architectural levels are now being developed.[37]

5.30 The Defence Capability Investment Committee has two sub-committees—the Defence Capability Investment Sub-Committee (DCISC) which looks at capability systems and the Defence Information Environment Committee (DIEC) which looks at knowledge systems.[38] Should any conflicts arise, then the DIEC is the forum for achieving resolution. The DIEC applies a checklist—which is still in the draft stage—to detail how all projects are to be scrutinised so that they accord with the DIE architecture and support communication cohesion.[39]

34 ANAO, Report No. 11, 2000-2001, p. 51.
35 ANAO, Report No. 11, 2000-2001, p. 46.
36 Nicholson, *Transcript*, 2 March 2001, p. 31.
37 Nicholson, *Transcript*, 2 March 2001, p. 24.
38 Nicholson, *Transcript*, 2 March 2001, p. 23.
39 Nicholson, *Transcript*, 2 March 2001, pp. 23–24.

Committee comments

5.31 The Committee expressed its concern about the ability of Defence's information systems to interface across all its Service sectors so that all high level officers are able to access the same information when needed. While the Committee acknowledges that one logistics program was able to communicate successfully with other Defence information systems, the JCPAA was aware of many other programs than did not. Given Defence is in an acquisitions environment as a result of the *Defence 2000* white paper and as a result of a series of Government announcements following the white paper, the Committee questioned the degree of confidence with which, at the end of those acquisitions, Defence would have the maximum possible inter-operability, given the historic problems accompanying the development of inter-operability to date.

5.32 Defence acknowledged that the logistic support system—Standard Defence Supply System (SDSS)—is successful because it is operating at a relatively low level.[40] It agreed that difficulties arise when 'the control that we are trying to get on those sorts of stovepipe systems is at a higher level to make sure that the finance can talk.'[41]

> When it [SDSS] is used for its purely functional purposes for logistic support of a submarine when no-one outside that system needs to know that sort of detail, then we do not get involved. In fact, the principle that we use is that the business process owner is responsible for that. There is some level at which he must exchange information with other systems, and that is when we become involved. That is what the architecture is all about.[42]

5.33 Defence informed the Committee that communication across all three arms of Defence down to a reasonable level—the sub-unit level—has now been achieved and fundamental blockages have been removed. Wider bandwidth has facilitated the smooth dissemination of information across Australia. As technology improves, communication and information dissemination will improve.[43]

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40 Nicholson, *Transcript*, 2 March 2001, p. 30.

41 Nicholson, *Transcript*, 2 March 2001, p. 30.

42 Nicholson, *Transcript*, 2 March 2001, p. 30.

43 Nicholson, *Transcript*, 2 March 2001, pp. 24–26.

5.34 Defence emphasised that the information architecture ensures that new acquisitions will be able to interact to a high degree 'in a combat effective way' with other Defence information systems, since 'every project passes through one of these two sub–committees' or the main committee. No project will proceed unless it actually satisfies specific checkpoints or 'unless there is compelling argument for it not to reach it'.[44]

5.35 The Committee urges Defence to finalise its specific project architectural checklists as soon as possible so that these can be disseminated across all sectors and the Services, and become part of the negotiation requirements in any new project. The Committee furthermore urges Defence to educate its staff so that they become aware of the importance of the Defence Knowledge Improvement Plan as a detailed guide for enhancing the Defence information environment.

Integration Authority

5.36 Formulating and adopting strategies and plans to manage all Defence knowledge edge issues in a coherent and integrated way is a challenging task. ANAO described in Appendix 3 of its report, the difficulties experienced by the UK, USA and Canada.[45] It concluded that the UK, USA and Canadian defence organisations have responded to difficulties in achieving coherent and integrated information systems:

> …by establishing a group responsible for knowledge system policy and development; and by establishing business processes that focus on managing operational, systems and technical elements. The aim is to allow systems related to the knowledge edge to evolve and be updated as coherently as practicable.[46]

5.37 The UK Ministry of Defence recently addressed the need for formal management of integration issues during acquisition by establishing an Integration Authority in its Defence Procurement Agency. The Integration Authority's purpose is to maintain technical visibility of all relevant projects under procurement and

44 Nicholson, *Transcript*, 2 March 2001, p. 33.

45 ANAO, Report No. 11, 2000-2001, pp. 64–68.

46 ANAO, Report No. 11, 2000-2001, p. 68.

to bring to the Ministry's attention any developments that could adversely affect information coherency. The ANAO sees merit in Defence adopting the UK Integration Authority (Defence Procurement Authority) arrangement to work closely with the Chief Knowledge Officer.[47]

5.38 In its submission, Defence maintained that since the UK Integration Authority was still evolving, it should be monitored rather than just adopted.

> Defence has not yet formed a view that organisational change is required to achieve the integration function.…Any lessons learned [from the UK Integration Authority] will be fully considered.[48]

5.39 At the public hearing, Defence explained that it has 'started looking in more detail at how the Integration Authority in the UK is operating, and we are currently trying to come to grips with how that is working'.[49]

> Our initial understanding is that the Integration Authority is in part working as a small organisation but is also using integrated project teams—IPTs—types of arrangements, processes and tools as part of the mechanisms that they are developing. The use of integrated product teams in the UK Procurement Agency is one of the principles that underpins how they are approaching the acquisition of new systems.[50]

5.40 In the meantime, the Defence Materiel Organisation (DMO) has already established several positions with an integration function focussed on providing materiel support during project definition and development.[51]

> …we are looking at our role with the Defence Information Systems Group…at what processes of governance we need to have in place that will ensure that the architectures being defined by [the Chief Knowledge Officer] are going to be implemented. What we are suggesting there is that it is highly likely that we may

47 ANAO, Report No. 11, 2000-2001, p. 51.
48 Defence, Submission no. 3, p. 3.
49 McKinnie, *Transcript*, 2 March 2001, p. 31.
50 McKinnie, *Transcript*, 2 March 2001, p. 31.
51 Defence, Submission no. 3, p. 3.

> actually have a solution which is a combination of organisational restructurings, but we are hoping that we might be able to capture that as we are going through the current DMO establishment processes as well as tools to assist people in implementing the architectures as they are defined.[52]

5.41 When questioned further by the Committee on the ability of the various systems used in Defence to interact smoothly with each other, Defence replied that 'the biggest push we had in relation to pushing the knowledge edge as a capability, and building integrated command and control systems, integrated surveillance systems and integrated intelligence systems', occurred in 1997, following the Defence White Paper.[53] A total of 177 personnel had been trained for the Integrated Acquisition Teams.[54]

5.42 The Committee still has strong reservations that integration and total interaction were always being taken into account when Defence was planning or negotiating new projects. This had implications for 'through–life support costs', already a costly item for projects such as JORN and the Collins submarines. Defence stated that it was looking at 'a number of cost estimating models and trialing the use of some of those models from the US and other sources' to see if they will provide more accurate whole-of–life costs.[55] Defence maintained that the new architecture together with specific checkpoints for all projects will help ensure that integration and interaction are being considered.[56]

Standardised Project Management Method

5.43 A standard project management method—effectively and consistently applied—provides an important foundation for good program management. It can establish for each project in a portfolio of projects, a specified set of concepts and project management processes that becomes the minimum requirements for a properly run and managed project. ANAO stated that the

52 McKinnie, *Transcript*, 2 March 2001, p. 31.
53 T McKenna, *Transcript*, 2 March 2001, p. 32.
54 ANAO, Report No. 11, 2000-2001, p. 75.
55 McKinnie, *Transcript*, 2 March 2001, p. 32.
56 Nicholson, *Transcript*, 2 March 2001, p. 33.

most significant business process in Defence is its Standard Project Management Method (SPMM) based on the UK Central Computer and Telecommunications Agency's system and its approach to program management.[57] The Defence Materiel Organisation (DMO) is providing training in its SPMM for Defence personnel engaged in major acquisition projects. At the time of the audit, 603 staff members had been trained but this was less than 50 per cent of the total staff involved.[58]

5.44 The Knowledge Staff and the DMO are establishing the major organisational structures and business processes needed to interface with program management. It is endeavouring to convert all 200 or so major acquisition projects to SPMM. However, ANAO reported that 'as at April 2000 there were 64 acquisition projects subject to the SPMM but only two of these were assessed as controlling their projects well using the SPMM.'[59]

5.45 Defence informed the Committee that:

> As of November 2000, there were 105 Major Capital Equipment acquisition projects in the DMO subject to the Project Management Methodology (PMM). The ongoing evaluation of the effectiveness of the PMM has revealed monitoring and control to be a major weakness in the PMM implementation. In particular, PMM Project Boards have been identified as being inadequate in their governance and assurance roles and are being reviewed.[60]

5.46 The Committee noted ANAO's comment that:

> …further action appears desirable to not only ensure that SPMM in Defence is not applied in too many variations, but also to remove any confusion about the role of SPMM and any associated Project Boards, Integrated Product Teams, Integrated Acquisition Teams and Integrated Project Teams.[61]

5.47 The Committee endorsed ANAO's recommendation 'that Defence carefully monitor its adoption of the Standard Project Management Method (SPMM) to ensure that core and essential

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57 ANAO, Report No. 11, 2000-2001, p. 52.
58 ANAO, Report No. 11, 2000-2001, pp. 53, 75.
59 ANAO, Report No. 11, 2000-2001, p. 52.
60 Defence, Submission no. 9, p. 1.
61 ANAO, Report No. 11, 2000-2001, p. 53.

elements have a high degree of consistency across Defence.'[62] The Committee further noted that Defence agreed with this recommendation and is reviewing the effectiveness of its project management methodology while progressively implementing improvements in its applications.[63]

5.48 Defence assured the Committee that new arrangements for SPMM Project Boards to provide governance functions along with new operating arrangements should be established by June 2001. Other improvements to processes, systems and training were being identified and progressively implemented.[64] While the Committee accepts that progress is being made, it reiterates its belief that there should be a high degree of consistency in project management across Defence. This can only result if Defence trains its staff to a high degree of efficiency and effectiveness.

New acquisition methods

5.49 In this technological age, the timeliness in the incorporation of new systems affects the capabilities and effectiveness of Defence's knowledge capabilities. Defence has often experienced long delays in its acquisition of projects, many of which involved long time-scales in their development. The result was that 'systems are often fielded with obsolete equipment; require expensive upgrades shortly after delivery; and are delivered late because time was spent implementing requirements that changed during the course of the project.'[65]

5.50 Defence has adopted the Evolutionary Acquisition (EA) strategy to try to overcome these disadvantages. Evolutionary Acquisition (EA) is defined as:

> The incremental specification, design, implementation, testing, delivery, operation and maintenance of systems. The delivery of each incremental release increases the overall capability of the system until it is complete. In this way users of the system get early access to functionality and are encouraged to provide feedback on functionality and performance. The feedback is used in

62 ANAO, Report No. 11, 2000-2001, p. 54.
63 Defence, Submission no. 3, p. 3.
64 Defence, Submission no. 9, p. 1.
65 ANAO, Report No. 11, 2000-2001, p. 54.

> subsequent increments to shape the development of the system as it evolves to its final form.[66]

5.51 However, ANAO reported that there was widely held view among Defence staff that EA guidance was poorly developed and therefore its full potential was not being realised. Acquisition staff had limited experience in EA and were 'still evolving' the means for separating EA costs from in-service upgrades.[67]

5.52 In its submission, Defence agreed with ANAO's recommendations and added:

> The Defence Materiel Organisation is developing greater experience in Evolutionary Acquisition and will continue to learn. This experience will be used to assess the appropriateness of Evolutionary Acquisition methods for acquisition of new systems at the time of procurement approval.[68]

DIE staffing profile

5.53 In the *Defence 2000* white paper, the Government stated that one of its major projected outcome is for:

> …the establishment of a single collocated Theatre Headquarters, and the development of two deployable headquarters to provide on the spot command for two deployed forces simultaneously; a single integrated command support system linking all ADF elements; and an integrated personnel, logistics and financial system based on e-business principles.[69]

5.54 However, Defence encounters difficulties in recruiting and retaining the highly-skilled personnel needed to support the Defence Information Environment (DIE) in the civilian, single Service or in the joint domains. The military and civilian workforce that supports DIE is spread across a wide range of projects and endeavours. The competitive employment market for IT specialists, and intelligence specialists, policy officers and

66 ANAO, Report No. 11, 2000-2001, pp. 84–85.
67 ANAO, Report No. 11, 2000-2001, pp. 54–55.
68 Defence, Submission no. 3, p. 3.
69 Defence, *Defence 2000*, pp. 96–97.

project staff, means that many Defence employees are enticed to jobs in the wider community.[70] As described by ANAO:

> In practice, it has been necessary to address shortages of skills in one area by denying essential skills to another. Defence's information environment is vulnerable to shortages in staff with the appropriate skills and experience.[71]

5.55 ANAO recognises Defence's difficulties in this area but considers that, in view of the substantial risks to knowledge projects and the importance of maintaining the DIE at a high level of capability, there is a need for more formal and holistic planning and management of the DIE workforce.[72] ANAO recommended that:

> … Defence undertake formal workforce planning and management assessments of the Defence Information Environment workforce to ensure that training, postings, career prospects and professional development are carefully planned and that a holistic view, at least in a strategic sense, is taken in relation to these matters.[73]

5.56 In its submission, Defence indicated that the Chief Knowledge Officer, with other stakeholders, commenced a scoping study into the education and training of staff in February 2001, with a reporting date of June 2001. Defence also maintained that 'the degree to which centralised control is required is unclear'.[74] Any action should await this report.

5.57 At the public hearing, Defence said that its major problem was retaining staff rather than recruiting them, although that aspect is a problem as well.[75] This is why it hoped its scoping study will help in identifying 'the magnitude of the problem and ways to fix it'.[76]

> …for the first time we will be looking at all those sorts of people as a whole rather than separately in their own streams, as they have been in the past.[77]

70 ANAO, Report No. 11, 2000-2001, p. 55.
71 ANAO, Report No. 11, 2000-2001, p. 55.
72 ANAO, Report No. 11, 2000-2001, p. 56.
73 ANAO, Report No. 11, 2000-2001, p. 56.
74 Defence, Submission no. 3, p. 3.
75 Nicholson, *Transcript*, 2 March 2001, p. 34.
76 Nicholson, *Transcript*, 2 March 2001, p. 33.
77 Nicholson, *Transcript*, 2 March 2001, p. 33.

5.58 Menawhile, the Chief Knowledge Officer is developing a 'Defence Knowledge Improvement Plan' as a detailed guide for enhancement of the Defence Information Environment over the next ten years.[78]

5.59 Defence went on to explain that while some degree of central supervision is necessary in the knowledge area, it intends in the first instance:

> …to focus on what are the issues and, in particular, what are the common competencies across all the different areas that are needed to see whether, for instance, we want to do some common training in those areas.[79]

5.60 The Committee agrees that information gathered from the scoping exercise is an important first step in the organisation of Defence's information capabilities supporting the defence of Australia. The appointment of the Chief Knowledge Officer and the establishment and acknowledgment of the importance of the knowledge edge provide a clear focal point across the whole Defence portfolio.

5.61 However, in order to achieve its goal, Defence has to change its existing culture so that a holistic approach can be achieved. Management of knowledge system projects in Defence is a complex and demanding task. Integrated training is essential if this change is to be implemented successfully. Acknowledging this fact, Defence told the Committee:

> …as we post, say, a Navy person out of Navy into the Defence Information Systems Group, while he or she is in the Defence Information Systems Group he or she may need some additional training so they are ready to go back to the Navy on their next posting, and we need to make sure that all of those sorts of mechanisms are coordinated properly. It is still very early days, but we really did want to approach it with a pretty open mind.[80]

5.62 Furthermore, the Committee was assured by Defence that it does not underestimate the challenges of developing its knowledge edge. Defence argued it was demonstrating its awareness and commitment since:

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78 Defence, Submission no. 3, p. 4.

79 McKenna, *Transcript*, 2 March 2001, p. 33.

80 McKenna, *Transcript*, 2 March 2001, pp.33–34.

a. it has a plan for coherent development of all elements of its information environment,

b. it is putting in place the governance, architecture and compliance mechanisms to oversee this development,

c. it is continuing to improve its approach to the 'knowledge edge' through a substantial research effort and better acquisition procedures, and

d. it is starting to understand the people issues associated with knowledge improvement and managing the Defence Information Environment, as part of the high priority that Defence as a whole will be putting into personnel in 2001.[81]

Committee comments

5.63 Having considered the evidence available, the Committee believes that the Chief Knowledge Officer and his staff are embarking on ground-breaking work. The Chief Knowledge Officer requires clear lines of responsibility and accountability—commensurate with his program management responsibility—to be established. The Committee expects that the corporate governance and accountability changes announced in June 2000 will provide this support, in spite of the number of acquisition projects which will not be sponsored by the Chief Knowledge Officer.

5.64 The existence of the Defence Capability Investment Committee and the requirement that all projects be assessed in terms of their contribution to the knowledge edge will hopefully ensure that all tasks critical to knowledge system development, such as the even application of a standardised project management method and improvement in acquisition methods, be monitored carefully by those responsible. The Committee is mindful that many knowledge system elements now in service were originally selected on the basis of individual functionality and not on the basis of their architectural compliance with the broader system of systems.

5.65 Building a knowledge system based on a coherent architectural framework is necessarily long-term and challenging, given the

81 Defence, Submission no. 3, p. 4.

rapid advances in technology, ADF's wide-ranging tasks and Defence's evolving organisational relationships and business processes. ANAO has reported that the Chief Knowledge Officer and his staff have made a creditable start on developing some foundation management concepts and processes necessary to monitor and control knowledge system program risks. However, ANAO concluded that:

> The Chief Knowledge Officer and his staff have much to do to bring the Defence information environment under adequate managerial control.[82]

5.66 The major concern the Committee has about Defence's ability to develop a knowledge edge which has adequate coherence, centres on Defence's ability to recruit, develop and retain skilled individuals needed in all parts of the Defence information environment. The Committee believes it appropriate that ANAO conduct a follow-up audit after June 2001, when Defence's scoping exercise is completed and Defence will have developed strategies to assist its recruitment, development and retention of skilled personnel.

Recommendation 5

5.67 **The Committee recommends that the Australian National Audit Office conduct a follow-up audit into Defence's strategies for recruiting, developing and retaining skilled IT personnel.**

Bob Charles MP
Chairman
27 June 2001

82 ANAO, Report No. 11, 2000-2001, p. 57.