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Audit Report No. 43

Life-cycle Costing in the Department of Defence

Introduction

2.1 Life-cycle costing (LCC) is a technique for estimating the total cost of ownership of an asset over its lifetime. Its purpose is to assist decision-makers to make more informed decisions with respect to the acquisition and management of assets. As an asset management tool, LCC can be applied at any stage in the life of an asset—at the initial planning stage, through budgeting to source selection, in-service management and at disposal.

2.2 Within the Department of Defence, LCC is used primarily in tender selection in areas of major capital equipment and facilities as well as in minor capital and administrative acquisitions. Acquisition costs within Defence are substantial. For example, the 1997-98 budget provided $2.8 billion for major capital equipment and facilities acquisition. Life-cycle

costs are estimated at between two and three times capital costs, clearly accounting for the majority of the defence budget.[1]

2.3 The audit report examined whether Defence applies LCC appropriately in support of decisions throughout the acquisition and management of its capital assets, and whether there are areas where remedial action is needed. The audit found that 'Defence's performance would benefit by promoting extended use of the technique to ensure major financial decisions are cost-effective.'[2]

2.4 Consistent with this aim, the Committee believed that further examination was needed into the extent of LCC in Defence; the reasons why LCC is generally restricted to tender selection and does not extend to other key stages in the asset management cycle; and, finally, other areas of the asset management cycle where LCC could be extended to ensure that major financial decisions are cost-effective.

Life-cycle costing in Defence—policy

2.5 Commonwealth Procurement Guidelines require that procurement practices and procedures across the public sector be directed to achieving the best available value for money in the acquisition of goods and services for government programs. The guidelines state that 'The test of the best available value for money is a comparison of relevant benefits and costs on a whole-of-life basis.'[3]

2.6 Defence policy on the use of LCC is outlined in a 1992 Defence Instruction as well as in other official documents. This Defence Instruction states that LCC is to be applied at decision points throughout the life-cycle of an equipment or weapon system, although there is no mention of the application of LCC in other areas, such as administrative or facilities acquisition.[4]

2.7 The Defence Logistics Manual details the requirements for life-cycle cost models and proposes tender and contract clauses relating to the provision of LCC data. The Defence Procurement Policy Guide stresses the need for

1 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. xi.

2 Ian McPhee, ANAO, *Transcript*, p. 5.

3 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 10.

4 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 10.

purchasing officers to ensure the best value for money by evaluating what suppliers offer in a comprehensive and professional manner and by taking account of the benefits and costs on a whole-of-life basis. The Directorate of Contracting Policy has also issued guidelines for whole-of-life costing, complementing the Defence Costing Manual which provides officers with a checklist of cost categories to be included.[5]

Committee comments

2.8 The Committee accepts that, in general, Defence policy on LCC accords with Commonwealth procurement guidelines requiring that purchasing be efficient and effective.

2.9 Nevertheless, the Committee agrees with the findings of the ANAO that:

- there is considerable scope for simplification by expressing LCC policy in the form of a single overall policy statement; and that
- this document should reflect the notion that life-cycle costing is an important tool to aid decision-making and should therefore be tailored to reflect the requirements of the relevant decision-makers.[6]

Life-cycle costing in Defence—reality

2.10 The Committee notes the finding of the ANAO that 'Defence policy has been set for LCC for some time, but there appears to be little top-level enforcement or encouragement at present for the use of LCC throughout the acquisition life-cycle.'[7]

2.11 In the Department of Defence, LCC is applicable at three main decision stages for capital equipment—capability proposal, acquisition and in-service management—as well as for facilities and administrative acquisitions.

2.12 The ANAO found that while 'There are many cases where Defence uses LCC to support decisions, mostly in relation to tender selection…LCC is

5 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 12.

6 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, pp. 13–14.

7 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. xii.

not generally used at other stages in the acquisition life-cycle…'[8] At the hearing, Mr Gilbertl Watters from the Department of Defence stated that life-cycle costing is '…a reliable indicator of relativities between offers that are in the tender box.'[9] However, he conceded that life-cycle costs had not been a determining factor in selecting one system over another.[10]

Capability proposal stage

2.13 This stage entails consideration of the capability proposal by the Defence Capability Committee (for higher level projects) and the Capability Forum (for less significant proposals); consideration by the Defence Management Committee for inclusion in the overall budget; and final approval by the Government in the context of its annual budget.

2.14 This is the first conceptual planning stage in the material life-cycle. It involves the development of capability proposals prior to approval by Government. Initial proposals for new capabilities are put forward and the outlines of performance, cost and timing are assessed for cost-effectiveness on the basis of comparisons made across the spectrum of potential Defence investments. Thus life-cycle costs are one of the major factors, along with capability and timing, which should be considered at the initial concept stage.[11]

2.15 ANAO investigations revealed that '…Defence has not taken full advantage of the opportunity to employ life-cycle costing analysis at the conceptual stage'.[12] While proposals consider some aspects of operating costs and the logistic concepts to be employed to support the capability, it appears to be uncommon for costs to be assembled in the form of LCC estimates. For example, of the case studies selected by the ANAO, none included life-cycle cost analysis at the capability proposal stage.[13]

8 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. xii.

9 Gil Watters, Defence, *Transcript*, p. 13.

10 Gil Watters, Defence, *Transcript*, p. 8.

11 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 16.

12 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 20.

13 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 18.

Committee comments

2.16 While acknowledging that complete data will not always be available, the Committee strongly believes that LCC analysis has the potential to provide relevant information to assist decision-making at the conceptual stage, and that the Department of Defence has not taken full advantage of the opportunities offered by LCC.

Acquisition stage

2.17 The acquisition stage consists of initial planning and a request for tender (or a similar document), followed by tender selection and contract negotiation.

2.18 In the Department of Defence, the acquisition stage generally occurs over a period of years, commencing with the original project approval. During this stage, LCC can be particularly useful in assisting value-for-money decisions with respect to tender evaluation.

2.19 The acquisition stage usually commences with the commissioning of a Project Definition Study to collect additional relevant information. A Request for Tender document is then prepared, requesting of all tenderers a range of information, including LCC data, which provides a basis for evaluation of tenders by a tender evaluation board. Following the selection of the successful tenderer, negotiations commence culminating in the signing of contracts.

2.20 While it is generally not feasible to undertake an accurate LCC analysis at the start of the acquisition stage, a reasonable estimate of the total cost of ownership of a capability is possible. However, as the project moves to the Request for Tender and Tender Evaluation phases, LCC analysis can be undertaken with a higher degree of accuracy.

2.21 In examining seven major capital equipment case studies, the ANAO found that LCC analysis had been utilised with varying degrees of adequacy and success. In each case LCC analysis was used to support the decision. However, LCC by itself never changed the preferred tenderer.[14]

Committee comments

2.22 In this regard, the Committee agrees with the ANAO that a more complete inclusion of costs would enable better identification of the full impact of

14 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, pp. 22–3.

tendered proposals on these costs, and enable better forecasting of future support requirements.

In-service management stage

2.23 This stage covers decisions concerning the management and disposal of assets.

2.24 In its report, the ANAO argued that LCC analysis can be a useful tool in the effective and efficient management of equipment after it has been introduced into service. It can assist decisions on the best logistic support option for new equipment, and on adjustments needed to the support provided for existing equipment, as well as decisions on whether and when to replace equipment.[15]

2.25 The ANAO showed that LCC can assist in making decisions when a major component is failing too frequently, raising the need to consider options such as replacing the component with a more reliable one in all prime equipment, purchasing more spares or changing the maintenance policy completely.

Committee comments

2.26 The Committee therefore accepts that despite the potential uses of LCC in tracking the life-cycle cost of components and in identifying the need for remedial action such as replacement or modification, the use of LCC analysis during in-service management of equipment remains limited in Defence.

Facilities and administrative acquisitions

2.27 As well as major capital equipment, LCC analysis can be applied during the design, construction and the ongoing maintenance phase of a facility. During the design phase, LCC can be used to identify the optimal design to minimise life-cycle costs, and in the maintenance phase to maximise the performance of the building.[16]

2.28 At the time of the ANAO audit, Defence Estate Organisation, which manages Defence facilities, had no comprehensive policy concerning the use of LCC analysis during the life of a facility. As in the case of capital

15 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 28.

16 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 36.

equipment, the use of LCC in relation to facilities projects was found to be uneven. In fact, the evidence suggests that despite LCC being required under Defence Estate Organisation policy for the project initiation, design and construction phases, this information is not always sought by Defence.[17]

2.29 The ANAO also examined the potential application of LCC analysis to office equipment purchases, such as photocopiers, fax machines and printers which require ongoing support after purchase. It found that, while there was some appreciation of LCC principles, purchasing decisions could be enhanced by further guidance, advice and assistance.[18]

Constraints on the use of life-cycle costing

2.30 While the Committee accepts the view of the ANAO that there is a need for a more comprehensive and coordinated application of LCC analysis within the Defence Department, it recognises that there are significant constraints to achieving this at present. Most significant are poor data quality coupled with a lack of LCC expertise and knowledge.

Quality of data

2.31 Both the audit report and the evidence gathered from witnesses highlighted the fact that there are presently major limitations in the data needed to support LCC analysis.

2.32 Defence officials pointed out that the information provided by tenderers about the future costs of their products is frequently unreliable and incomplete and unable to support LCC analysis. At the same time, they argued that by enforcing a reliability forecast, Defence would effectively force the risk onto the contractor who would charge a premium for providing a guarantee.[19]

Committee comments

2.33 While the Committee understands the Defence Department's concerns, it is strongly of the view that all parties to the contract have responsibilities

17 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, p. 38.

18 Auditor-General, *Audit Report No. 43, 1997-98, Life-cycle Costing in the Department of Defence*, pp. 41–2.

19 Desmond Meuller, Defence, *Transcript*, p. 13.

and should be accountable for the quality and reliability of the services they provide.

2.34 To this end, the Committee agrees with the ANAO that Defence should:

- ensure that LCC analyses provided by tenderers are adequate and given due weight in source selection considerations; and
- require tenderers, as part of their contract performance, to make a firm commitment at the contract stage regarding the significant claims relating to reliability and other LCC information as a way of reducing some of the risks to the Commonwealth of unexpected future costs.

2.35 The report also shows that there are many other sources of information on operating costs. Thus a reasonable approach is to seek multiple sources of data which can then be used to provide a more valid and accurate estimate of costs.

2.36 It is therefore the view of the Committee that many of the problems of data quality can be addressed by concerted efforts to extract suitable information from existing data bases and by ensuring that that any future redevelopment of data bases is undertaken in the context of the need for specific data to support LCC analysis.

Incentives and expertise

2.37 The audit report was critical of the lack of top-level encouragement for the use of LCC analysis. For example, there are few incentives for middle managers to adopt LCC costing principles by making investments now to save operating costs in the future.[20]

2.38 The Committee was also provided with evidence that staff are not always confident that they have sufficient information and training to perform life-cycle costing appropriately. For example, with respect to the capability proposal stage, the ANAO found that the conduct of LCC analysis frequently depends on officers seeking precedents set by other projects, liaising with those they believe to have some knowledge of LCC and through personal research.[21]

20 Auditor-General, *Audit Report No. 43, 1997–98, Life-cycle Costing in the Department of Defence*, p. xii.

21 Auditor-General, *Audit Report No. 43, 1997–98, Life-cycle Costing in the Department of Defence*, p. 17.

2.39 This lack of expertise and support for staff appears to be exacerbated by the absence of a centralised core of expertise on LCC analysis which can be called upon to provide guidance to staff where this is needed.[22]

Other factors determining source selection

2.40 At the hearing, representatives from the Department of Defence argued that LCC is one of several factors taken into consideration when determining tender selection. Other considerations include technological specifications, the terms and conditions of the contract and the system's capability. The argument that selection should never be based on LCC estimates alone was emphasised by Mr Gilbert Watters, Director General, Acquisition, Finance and Reporting at the Department of Defence:

> The basis of source selection is not necessarily the cheapest price in the tender box. It is a multi-dimensional decision that involves consideration not only of the offer but whether it will meet the technological specification for Australian industry and the extent of that, the terms and conditions of the contract and life cycle costing. Many other factors are taken into consideration in determining company A over company B in terms of the offers in the tender box. Life-cycle costing is a factor which we take into account, but it is one of many factors which we take into account.[23]

Cost

2.41 Defence also expressed the view that a comprehensive costing exercise using LCC analysis would be extremely costly and in some instances these costs would outweigh the benefits of LCC analysis. It was argued that:

> To pursue them [the ANAO recommendations] to what I would call the ultimate—in other words, the way they would be applied in an ideal world—is more than I can afford or more than Defence can afford. It is a question of being able to pursue them to the point where we can guarantee that the benefits of doing it outweigh the costs, but we are not going to be able to ever realise the ideal world as these recommendations would aspire to.[24]

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22 Auditor-General, *Audit Report No. 43, 1997–98, Life-cycle Costing in the Department of Defence*, p. 62.

23 Gil Watters, Defence, *Transcript*, p. 7.

24 Desmond Meuller, Defence, *Transcript*, p. 17.

Other Committee comments

2.42 The Committee accepts the budgetary constraints under which Defence operates and acknowledges that the department is already implementing measures which will enhance its ability to accurately track the costs of assets over time. These measures include:

- formation of the Joint Logistics Systems Agency, which has instigated a through-life support disciplines project, including LCC analysis;
- recent calls by Defence for tenders to provide life-cycle costing services to Defence projects (It is envisaged that a panel of people with relevant industry experience will act as a resource for decision-makers within Defence.); and
- initiatives by Defence to identify those jobs for which expertise in life-cycle costing is a core competency.

2.43 The Committee welcomes these measures and suggests that such measures would be complemented by the adoption of the following ANAO suggestions:

- introduction of contractual arrangements committing tenderers to their assertions about reliability and life-cycle costs;
- increased efforts to extract relevant information from available data bases;
- where appropriate, redevelopment of data bases to provide more suitable information;
- centralisation of expertise in life-cycle costing;
- development and promulgation of guidelines to assist staff using LCC analysis; and
- greater incentives for middle managers to adopt life-cycle costing principles.

2.44 The Committee notes that well over a year has elapsed since these recommendations were advanced by the ANAO. At the time of the public hearing, little progress appeared to have been made. As noted above, Defence cited cost as a constraint on the implementation of the ANAO's recommendations. While the Committee is mindful of the need to use resources efficiently, there is little point adopting a policy of life-cycle costing if there is insufficient resolve to implement it. Further the Committee notes that the basis on which this policy was adopted was that it would ultimately produce savings for the department.