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MONITORING PROJECT PROGRESS

Introduction

4.1 The new submarine project has experienced irrecoverable schedule overrun. Defence's initial expectation was that it would have five operational Collins submarines at this time. However, it has one operational Oberon submarine.

4.2 At January 1998 prime contract expenditure exceeded 95 per cent of the contract sum while Navy had provisionally accepted only two submarines. On 30 April 1999, a third submarine, *Waller*, was provisionally accepted by Navy. The remaining contract payments (and other funds available to ASC) are required to fund ASC's submarine construction, tests and trials operations until the last submarine's warranty period expires in May 2002. Any amendments that affect ASC's scope of work will change the project's remaining cash flow and risk balance.¹

4.3 Complex projects require a range of methods to monitor progress. The submarine Project Office uses, amongst other things:

- a contract monitoring and contract control system (CMACS) to monitor work package progress in terms of costs and schedules; and
- direct on-site work package progress verification.²

Contract Management and Control System

4.4 Defence monitors the submarine project through the Contract Management and Control System (CMACS), which is

1 *Audit Report No. 34, 1997-98*, p. xiv.

2 *Audit Report No. 34, 1997-98*, p. 39.

specified as the contracted management system. The contracted work is expressed in approximately 2 700 work packages, each of which is divided into activities, and where appropriate, sub-activities. Defence measures progress against these activities and adds the progress to assess the percentage completion of the project.³

4.5 The ANAO's 1992 audit found that CMACS provided a reasonable means of measuring Commonwealth expenditure on work packages and the aggregation of that expenditure. However, the 1992 audit raised concerns about CMACS suitability as the primary contract management and control system. These concerns were heightened by the inconsistency between the Project Office's 1992 assertions that the project was on schedule and the ANAO's analysis which indicated irrecoverable schedule slippage.⁴

4.6 In its 1998 Audit Report the ANAO expressed concern about the accuracy of the overall project schedule:

*CMACS as presently implemented is not a reliable indicator of actual progress.*⁵

4.7 In 1991, a United States (US) Department of Defense expert on cost and schedule control systems (CSCS) advised Defence that CSCS was superior to CMACS because it directly related to the product being built, whereas CMACS had no organisation scheme as to hierarchy of work packages or production sequence.⁶

4.8 Defence formally introduced the use of a (CSCS) in Defence contracts, in terms of progress reporting to Defence, in the Jindalee Operational Radar Network Project (JORN) contract of 1991. CSCS requires contractors to have performance management control systems consistent with standards laid down by Defence. The US expert recommended that Defence consider modifying the submarine contract to ensure Defence visibility of early-warning indicators being generated by the contractor's CSCS. However, the submarine

3 Department of Defence, Submission No. 1, pp. 5, 12; Mr James Muir, Director, Acquisition Review, DAO, *Transcript, 29 April 1998*, p. PA 52.

4 *Audit Report No. 34, 1997-98*, p. 23.

5 *Audit Report No. 34, 1997-98*, p. 43.

6 *Audit Report No. 34, 1997-98*, p. 42.

contract was not amended in the way recommended because Defence believed CMACS's removal would be contractually too difficult.⁷

4.9 ASC uses its Defence-accredited CSCS as its internal primary cost and schedule management system for its entire construction program. However, CSCS depends on CMACS for 80 per cent of its data, since 80 per cent of the design and construction work is carried out by ASC's subcontractors whose work ASC records through CMACS.⁸

4.10 Defence noted in the Audit Report that to maintain a validated system, Defence surveillance audits of the CSCS were required annually, but more frequent audits were conducted where considered necessary.⁹

4.11 Defence disagreed with the ANAO's Recommendation No. 4 that the annual CSCS surveillance audit at ASC be increased in frequency to twice each year and that the audit also include CMACS. Defence claimed that there was very good visibility of the contract and subcontracts.¹⁰

4.12 During the hearing, the Committee sought information from Defence on its use of CMACS and of CSCS to monitor progress, and comment on its rejection of the ANAO recommendation.¹¹

4.13 Defence stated that CSCS was applied to the project after it had commenced and, as a result, CMACS was the system used for invoicing:

On subsequent projects, we have not applied systems like CMACS but have relied upon the earned value system or the cost schedule control system [CSCS] to do both of those things for us. We have evolved a number of different approaches to payment, what we now call payment based on

7 Audit Report No. 34, 1997-98, pp. 42, 45.

8 Audit Report No. 34, 1997-98, p. 45.

9 Audit Report No. 34, 1997-98, p. 46.

10 Audit Report No. 34, 1997-98, p. 46; Mr Gilbert Watters, Acting First Assistant Secretary, Capital Equipment Program, DAO, *Transcript*, 29 April 1998, p. PA 52.

11 *Transcript*, 29 April 1998, pp. PA 51, 52, 53.

earned value, which is the output of the cost schedule control system [CSCS].¹²

4.14 Defence claimed that while the figure of 95 per cent of the contract price came out of CMACS, CSCS was run in parallel with CMACS:

Surveillance [by Defence] on the cost control system [CSCS] is to see that the ASC maintains the basic disciplines of project management that underlie their approach and that feed into CMACS to provide invoicing.

... the relevance of auditing or doing surveillance on the cost schedule control system is only to ensure that ASC has the basic disciplines in place; it is not directly tied to the payments that are being made.¹³

4.15 Defence referred the establishment of CSCS and the negotiations between Defence and ASC regarding Defence's access to records of ASC's costs of running the contract:

The frequency of once a year surveillance was established, based on a negotiated position between Defence and ASC and acknowledging the fact that CMACS was also in place and was under surveillance at the same time—so we had two looks, if you like, at similar aspects of data.¹⁴

4.16 Defence stated that the question as to how often CSCS should be under surveillance was a '... matter for judgment', but claimed that as payments were not being made directly on CSCS, it was not important to look at that system so often.¹⁵ Defence added:

... additional surveillance of the CSCS system [as recommended in the audit report] will add nothing so far as

12 Mr James Muir, Director, Acquisition Review, DAO, *Transcript*, 29 April 1998, p. PA 52.

13 Mr James Muir, Director, Acquisition Review, DAO, *Transcript*, 29 April 1998, pp. PA 52-3.

14 Mr James Muir, Director, Acquisition Review, DAO, *Transcript*, 29 April 1998, p. PA 53.

15 Mr James Muir, Director, Acquisition Review, DAO, *Transcript*, 29 April 1998, p. PA 53.

*visibility of progress is concerned, because that is not what that system is designed for.*¹⁶

4.17 The Committee sought further information from Defence on the adequacy of CMACS to reflect actual progress.¹⁷

4.18 Defence acknowledged that while CSCS provided data on work done and ASC's estimated cost to complete, that was '... quite separate from the picture that occurs in CMACS and the invoicing and the payments which are made on CMACS'.¹⁸

4.19 Defence stated:

*The essential difference between the two systems is that CMACS is reporting the actual work completed against progress but not against the contractor's costs; whereas the CSCS system will give those reports to the customer as well.*¹⁹

4.20 The ANAO notes that the systems are linked but are not verified by Defence for accuracy as a single system. The ANAO has informed the Committee that it continues to have doubts about CMACS ability to measure real progress.

4.21 In a submission to the Committee, Defence reiterated its view that the current surveillance pattern provided appropriate visibility of ASC's management, including rescheduling, and that more frequent surveillance of the CSCS would add nothing to its ability to manage the project.²⁰

16 Mr John Hyman, Commercial Director, Undersea Warfare Systems, Defence, *Transcript, 29 April 1998*, p. PA 54.

17 *Transcript, 29 April 1998*, p. PA 53.

18 Mr James Muir, Director, Acquisition Review, DAO, *Transcript, 29 April 1998*, p. PA 54.

19 Mr John Hyman, Commercial Director, Undersea Warfare Systems, Defence, *Transcript, 29 April 1998*, pp. PA 55-6.

20 Department of Defence, Submission No. 1, p. 5.

Claims audits

4.22 The Audit Report recommended that Defence review a larger proportion of ASC's work package claims in order to make a better assessment of overall progress. Defence disagreed with the recommendation.²¹

4.23 The Committee asked Defence to comment on its rejection of ANAO Recommendation No. 5.²²

4.24 Defence outlined the process for auditing claims from the contractor which resulted in approximately 15 per cent of packages being audited:

[The contractor] aggregates what he claims is physical progress. He must certify to the project office that that physical progress has been completed. For that he relies on his own audit of his own work and his own audit of his subcontracted work. I would point out that there is some advantage to the contractor in being very conservative as far as his certification of the subcontracted work is concerned, because once that is paid for he loses his ability to get that product.

In [auditing claims] ... we have audited about 15 per cent of the packages.

We think that the 15 per cent sample is adequate, bearing in mind that, if we are not satisfied, we can make it for a month higher....²³

4.25 In the Audit Report Defence maintained that the level of sampling was appropriate in terms of guidance provided in Australian standard AS1199. In a submission to the Committee, Defence made the point that the selection of 15 per cent of claims was not random and was based on a review of claims considered to be of higher risk.²⁴

21 *Audit Report No. 34, 1997-98*, p. 47.

22 *Transcript, 29 April 1998*, p. PA 54.

23 Mr John Hyman, Commercial Director, Undersea Warfare Systems, Defence, *Transcript, 29 April 1998*, pp. PA 55, 58.

24 *Audit Report No. 34, 1997-98*, p. 47; Defence, Submission No. 1, p. 6.

4.26 It was ANAO's view that AS1199 was unsuited to a fifteen-year, six-submarine construction program with diverse and changeable cost elements in monthly progress claims, and that there were significant risks for Defence in checking only 15 per cent of progress claim items.²⁵

4.27 ANAO told the Committee:

*The comment that underpins our recommendations 4 and 5 is the fact that we have so many packages either being reopened or remaining open and a lot of rework being done on those packages, it indicates to us that perhaps the overall funding profile for the project is under a lot of stress. That is why we recommended the review of those progress cost and schedule management systems, so that the Commonwealth can be sure that the contractor will not run into trouble in completing the project.*²⁶

Committee comments

4.28 The Committee notes the comments made by ANAO in April 1998 that the HMAS *Collins* was listed as 98 per cent complete but that there was quite a lot of rework being done on that submarine. The Committee concurs with the ANAO's view that there is a need to understand how the rework on *Collins* and the other submarines is being funded.²⁷

4.29 The Committee considers that although Defence appears to be confident that it has a good understanding of the cost and schedule changes occurring, there has been convincing evidence, presented over a long period, of the inadequacies of CMACS and deficiencies with CSCS as implemented in the submarine project.

4.30 Despite Defence's view that ASC's progress claims always equal the value earned by ASC, the ANAO has evidence of significant payments to ASC substantially in advance of earned value as assessed by ASC.

25 *Audit Report No. 34, 1997-98*, p. 47.

26 Mr Ray McNally, Director, Performance Audit, ANAO, *Transcript, 29 April 1998*, p. PA 56.

27 Mr Ray McNally, Director, Performance Audit, ANAO, *Transcript, 29 April 1998*, p. PA 58.

4.31 While Defence appears to rely heavily on the fixed price nature of the contract and the availability of certain securities in support of Commonwealth rights, the Committee considers that Defence must undertake appropriate risk management to reduce the possibility of prime contractor default.

4.32 The Audit Report noted that the submarines' construction schedule was subject to ongoing risk due to ASC's resources being diverted to defect rectification on the completed submarines and ad hoc in-service support of HMAS *Collins*. This situation is understood by ANAO to be having a significant effect on ASC's project scheduling and costs.²⁸

4.33 An **integral part** of ASC's CSCS system is an **estimate of ASC's cost to complete**. While there is understandable sensitivity about Defence's access to that cost data, the Committee notes the Audit Report statement that Defence's contract with ASC gives the Project Office the right to review ASC's CSCS *at least* annually.²⁹

4.34 The Committee notes that in the last 12 months, ASC has been providing Defence with some reports from its CSCS, including data on estimates in man hours to complete the project. Defence's next annual review of the CSCS was planned for May 1999.³⁰

4.35 The Committee agrees with ANAO that ongoing schedule changes require more frequent review than the annual review to reverify that schedule and cost outcomes can be met.

4.36 **Recommendation 3**

The Committee recommends that the Auditor-General's Recommendations No. 4 and No. 5 in Audit Report No. 34, 1997-98, concerning increasing the frequency of the cost schedule control system surveillance audit and increasing the proportion of work package progress claims reviewed, be implemented by the Department of Defence.

28 *Audit Report No. 34, 1997-98*, p. 46.

29 *Audit Report No. 34, 1997-98*, p. 46.

30 Mr James Muir, Director, Acquisition Review, DAO, *Transcript*, 22 March 1999, p. PA 141.

4.37 CSCS, as an earned value system, is a rigorous way of collecting data and reporting and monitoring the health of a project. The Committee notes that Defence now specify the use of an accredited CSCS in construction projects costing more than \$100 million.³¹

4.38 The Committee is very firmly of the view that Defence should never be in a position where the payments made for work done and the estimated contractor's cost to complete equal more than 100 per cent of the contract price.

31 *Audit Report No. 34, 1997-98*, p. 45.