Collins Class Sustainment Review

Phase 1 Report

4 November 2011

Report Issued by Mr John Coles

Review Team

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1 Foreword

The objective of this Phase 1 Report (Mobilisation, scoping analysis and planning) is to report the issues which the Review Team consider need to be addressed and to propose a structured scope of work, with a cost and time schedule for its execution. These deliverables have been based on the results of our initial consultations with the Departments of Defence (DoD), Finance and Deregulation (DoFD) and with ASC Pty Ltd.

2 Key findings

In the course of our review we identified many initiatives to improve the sustainment of the Collins Class submarines within the Royal Australian Navy (RAN), the Defence Materiel Organisation (DMO) and in the ASC. These included – creation of a senior submarine post in Navy headquarters to provide a much-needed focus for submarine matters in Canberra; establishment of the Australian Submarine Program Office for better coordination; and commencement by DMO of a reform program which recognises many of the sustainment challenges and provides a framework for addressing these.

Additionally, the impending In-Service Support Contract (ISSC) between the DMO and ASC sets out to provide a mechanism for performance-based contracting. We also observed that the submarines were well prepared for operations and the excellent team spirit between the RAN, DMO and ASC in Western Australia.

However it is clear that, evidenced by the fact that the Commonwealth has seen fit to establish this Review, there are some serious issues around the sustainment of the Collins Class. We see the key issues as:

- Poor availability caused by a crew shortfall, lack of spares and unreliable equipment.
- Strategic leadership lacks cohesion (para 5.5).
- DoFD, DMO, Navy and Industry not acting collectively as an “Enterprise” (para 5.6).
- Lack of clarity of accountability, authority and responsibility (para 5.8).
- Submarine domain knowledge thinly spread (para 5.10).
- Lack of robustness of Navy’s contribution to manning and sustainment (para 5.11).
- DMO tends to seek direct involvement at the tactical level (para 5.12).
- Performance based ethos yet to be embedded in the ASC (para 5.13).
- No long term strategic plan for efficient asset utilisation (para 5.15).
- Unclear requirement and unrealistic goals (para 6.2).

We address these findings in more depth later in this report. However, based on the distillation of the accumulated evidence, with the caveat that most information was gained verbally and lacks the necessary hard evidence-based approach that we are seeking to apply to the final recommendations at the end of Phase2/3, I feel confident in putting forward the following advice for early consideration:

- Resources should be directed to the provision of spares and rotables, leading directly to increased availability.

- Any decision to reduce the agreed Material Ready Days in year should only be taken by the Collins Class Program Manager or if not "materiel" by the Fleet Commander or his senior submarine advisor Commander SUBFOR. Both must formally consult the Capability Manager or his representative to ensure consumption of Unplanned Unavailability is correctly recorded and accounted for and so help to plan future resource allocations.

- The ISSC, while still in discussion, should be placed as planned. This should be used to drive a requirement for an early move to performance based contracting for the dockings in Western Australia on the principle it is wise "to crawl before walking and then running" (before a Full Cycle Docking in South Australia).

- The classification of Priority1 Urgent Defects by the submarine commander should be moderated by Commander SUBFOR to avoid over classification purely to increase priority for spares.

- As part of the crew training program Commanding Officers, Marine Engineering Officers and Weapons Electrical Engineering Officers should undertake a pre-joining course at ASC Pty Ltd and Pacific Marine Batteries (and other key suppliers) to gain a better insight into some of the intrinsic submarine design and equipment characteristics.

3 Introduction

3.1 What we were asked to do

The objective of Phase 1 of the Review, as set out in the Terms of Reference, is to determine the issues which need to be addressed in Phase 2 in order to put forward well-evidenced recommendations to establish satisfactory Collins Class sustainability at an affordable cost. In meetings with Ministers and our sponsors we were encouraged to range widely, with the sole exception of the ownership of ASC, which DoFD require to

remain undisturbed. The recent Rizzo Report[1] on amphibious shipping availability was brought to our attention as a model for our work.

3.2 Why the study is needed

Despite increases in funding for sustainment, and strenuous efforts on the part of the various authorities and agencies involved, the level of submarine availability continues to fall. The length of dockings is increasing and submarines frequently have to return to harbour with problems. Loss of availability had also been caused by lack of crews, and the level of crew availability remains critical to the support of operations. Ministers became increasingly concerned about damage to the national reputation and frustrated at the apparent inability of Defence to sort out the problems. There was also a strong perception, especially in the DMO, that the ASC was operating inefficiently on a forward funded cost-plus contract for sustainment. The two Commonwealth Departments involved - DoFD (as owner and shareholder of ASC) and DoD (as owner, customer and operator of the submarines) - determined that an independent review was needed to assist them in establishing solutions to these problems against benchmark levels of expected performance derived from international norms.

3.3 Terms of Reference, methodology and scope

Formal Terms of Reference (Annex A) were signed by the Chief of the Defence Force, the Secretary of Defence and the Secretary of Finance and De-Regulation. The review is to be conducted in four phases.

Phase 1: The objective of Phase 1 (Mobilisation, scoping analysis and planning) is to discover the issues which need to be addressed and to undertake the development of a detailed statement of work, deliverables, schedule and planning arrangements through initial consultation between the proposed Review Team, DoD, DoFD and ASC. The outcome of this phase will be a detailed and structured scope of work, with an accurate cost and schedule for its execution. This will form the basis of a contract amendment to complete the main body of the review.

Phase 2 will consist of data collection, analysis, option and implementation strategy development and interim recommendations. A key outcome of this phase will be a framework and industry best practice benchmarks against which the DMO, RAN and ASC performance in delivering Collins Class sustainment can be assessed.

Phase 3 will see the development and submission of a Final Report and recommendations, taking into account feedback and incorporating further clarification to

[1] Plan to Reform Support Ship Repair and Management Practises. Paul J Rizzo July 2011

the findings and recommendations, based upon the review of the Interim Report by DoD, DoFD and ASC.

Phase 4 will deliver the results of a Follow Up Review, Analysis and Recommendations, during which the Review Team will undertake a progress review of the transition to the new ISSC and an assessment of performance against the recommended framework and industry best practice benchmarks.

3.4 Objectives

The broad objectives set for this review by the sponsors are to determine:

a. the optimal commercial arrangements between Defence and ASC to support the delivery of efficient and effective Collins Class sustainment, which will be used to guide the on-going development of the ISSC commercial framework;

b. the appropriate performance goals for sustainment activity, based on world best practice efficiency and effectiveness benchmarks;

c. options for demonstrating value for money in sustainment activity and the supply chain arrangements;

d. opportunities for improvements in management arrangements between ASC, DMO and the RAN to achieve an efficient submarine sustainment business;

e. future infrastructure needs to support the submarine sustainment activity;

f. measures to be implemented by DMO and the RAN to ensure that ASC is able to operate under a performance-based contract; and

g. the subsequent priorities for ASC, DMO and the RAN reform to effect greatest improvement, given time, budget and system constraints.

It was not intended that this review should examine or make recommendations regarding ASC's overall governance framework, but rather address the commercial and contractual arrangements for submarine sustainment between ASC and DMO.

4 Conduct of the Review

4.1 The Review Team

The Review Team consisted of Mr John Coles CB FREng, Rear Admiral Fred Scourse RN (Retd) CB MBE FREng, Commodore Paul Greenfield AM RAN (Retd) MIEAust and Mr Arthur Fisher MIEE who were contracted to the Commonwealth as independent

consultants via the BMT Group, a well-known company supplying services to defence agencies world-wide. BMT's role was to provide on-the-ground administrative support to the team through BMT Design & Technology, their Australian company, undertaken by its Operations Director, Ms Samantha Tait. In parallel, the DMO offered the services of Mr Robert Clark to provide linkage into the Australian Government for the purpose of arranging and managing the program of interviews and visits. The Review Team wish to thank both Sam and Bob for their assiduous support, without which only a very small amount of our work would have been achievable in the three weeks assigned for Phase 1. CVs are provided at Annex B.

4.2 Methodology Adopted

In order to avoid being overly influenced, we did not at this stage study other reports on the Collins Class (of which there are reported to be no less than 18). The approach adopted by the Review Team is to focus strongly on what needs to be done to assure the future rather than to look for what has gone wrong in the past and who might be responsible. We are only interested in the past insofar as it informs us on how to move ahead. Further, we negotiated with our Sponsors that interviews would be conducted on a non-attributable and confidential basis in order to help us to establish the true position. Most of the evidence-gathering took the form of interviews with individuals or small groups, and we interviewed over 100 people during 60 interviews conducted during a three-week period. As well as visiting officials in Canberra, Adelaide, Melbourne and Fremantle, we visited the ASC's facilities in WA and SA, Pacific Marine Batteries (PMB) in Adelaide, Raytheon in WA and Canberra and three of the submarines, one in WA and two at ASC Adelaide. From the evidence we identified a large number of individual issues which we then grouped into themes using a structured method, and then developed a set of work streams to be followed through in Phase 2.

4.3 Code of Conduct

A method of working encompassing a 'code of conduct' and reporting arrangements for the review process was developed by the Review Team (see Annex C). This was designed to ensure that Phase 1 progressed quickly to the discovery of all relevant issues. It was accepted by Commonwealth representatives at the Kick-off Meeting for Phase 1 in Fremantle on 15 August 2011.

All members of the team are subject to non-disclosure agreements with the Commonwealth and the ASC.

4.4 Aspects Not Investigated During Phase 1

There are some areas which make a significant contribution to sustainment and for which we have not sought evidence as they did not appear to present issues during our initial review. These were:

a. Ammunition and weapon availability, including practise weapons;

b. Facilities used to support the submarine program, including naval bases, broadcast facilities, ranges and test facilities;

c. Operability of equipment;

d. Other key suppliers;

e. Submarine Escape and Rescue; and

f. Consumables, such as fuel and lubricants, food and general supplies.

Whilst we looked at the management of the technical issues which are currently affecting availability, we have yet to look into the technical fixes themselves. It is presently envisaged that only the key supplier issues will be examined in Phase 2. It is for consideration whether some or all of these areas should also be examined.

5 What we found

5.1 Overview

We found that the Collins Class Submarine Program has had a history of difficulties which have been well recorded. The problems originate from the very beginning of the program when, perhaps without fully appreciating the potential consequences, the Commonwealth embarked on the acquisition of a submarine which, for good reason, is quite unlike any other in the world.

The original in-service support solution, including the usage upkeep cycle, was found wanting - exacerbated over time - as the links with the original Design Authority were, in effect, severed. Further, the in-service reliability of some unique equipment, with their support arrangements, coupled with the inability to provide sufficient crews, were additional factors that led to a significant decline in submarine availability. Resolution and establishment of a coherent support solution will be a significant managerial challenge. It emphasises that the requirement for developing the sustainment arrangements for a class of submarines adopted at the front end of the acquisition process is a critical ownership issue that should be addressed as part of the lessons learned in Phase 2.

5.2 Implications of ownership

Ownership of a submarine design requires the 'parent nation' to invest in facilities and equipment to allow it to operate the submarines effectively - shipbuilding facilities, docks, manpower and training, operational support facilities, engineering and scientific resources, access to the necessary industry resources and skills, and a properly resourced and effective supply chain. Due to the failure to recognize fully what they were taking on, the various agencies involved did not make all the necessary investments post delivery and this, together with the unreliability of a number of key equipments in the submarines, got the program off to a poor start.

5.3 Role of the Navy

The role of the RAN in these events is another important factor in understanding the current situation for Collins Class. Historically the RAN has, at best, been lukewarm on its role as the owner of a fleet, albeit a small one, of submarines. However, the small number of submariners, especially at the more senior levels in Canberra, has led to difficulty in influencing policy issues and the well-publicised difficulties the RAN has been having generating and retaining a sufficient base of trained crews to support the boats' operational programs remain a key part of the story.

5.4 Entry into the operational phase

As the program entered the phase where submarines were due to become operational, there were difficulties between the original Design Authority (Kockums) and the ASC and within the consortium structure of ASC, resulting in a severance of the relationship with Kockums and the restructuring of ASC as a Government Business Enterprise (GBE) with the DoFD as shareholder and owner, and the Department of Defence's acquisition organisation (formerly DAO, now DMO) as customer. This has created a structure which has proved challenging to operate efficiently in practice, and in which the exercise of ownership of elements of the design often presents practical or process difficulties.

5.5 Relationships and leadership

These difficult relationships and the changes they engendered, together with the poor reliability being experienced by the submarines themselves, resulted in the overall program attracting a 'pariah' reputation both in official circles and with the general public. In this atmosphere, and without always having the clear leadership the program deserves, it has not proved possible to take the necessary steps to make adequate provision for the sustainment of the submarines through their operational lives. The submarines continue to be bedevilled by poor reliability, a lack of crews, and a lack of maintenance; all of which add up to poor availability.

This unhappy story has been conducted in the full glare of publicity, and this has conditioned behaviours, sometimes in a way that has made it even more difficult to achieve the level of leadership needed to manage such a large and important program out of its difficulties.

Despite the fact that virtually all the senior people we spoke to were clear that the Collins Class capability is 'strategic' for Australia, there is no clear or shared public understanding of why this is a strategic capability nor of the implications that this has for sustainability. This leads to misunderstandings, ambiguity, and a lack of common purpose.

Neither were we able to identify anyone who was charged with taking full responsibility clearly and decisively for all aspects of the sustainment of the Collins Class Program. There is no recognition that for a strategic program to succeed, it must be managed in such a way that all elements going towards an effective capability are brought together and delivered under an over-arching program management structure. This includes not just the materiel aspects within the DMO's purview, but also both civilian and naval manpower aspects, finance, supply chain across the whole field of infrastructure, operational requirements etc. At Annex D is a "mind map" which we prepared to illustrate the various factors which may contribute to submarine availability.

Whilst Defence has gone some way towards putting a program management structure in place for submarines, this has still to be developed and at present has serious limitations on its effectiveness in bringing together a number of different strands of activity as a result of the organisational boundaries which it is forced to recognise. Successive reorganisations over past decades, particularly in Defence, appear to have led to a situation in which the organisation has become quite complex and lacking in focus on sustainment.

5.6 The Submarine "Enterprise"

The strands of activity delivering the submarine capability should be operating as an "Enterprise" consisting of four elements (DoFD, DMO, RAN and Industry) whose shared objective should be to deliver the right level of submarine availability at the right price. Sadly, we were unable to avoid gaining the impression of highly-charged, difficult and often hostile relationships between the parties. Managing a monopsony situation can never be easy but DoFD does not, as owner and shareholder, set specific numeric performance goals on ASC to align with goals set by the customer (DMO and RAN); rather, it provides ASC with corporate objectives and a mandate founded on ASC efficiently and effectively discharging its submarine sustainment role and a principle objective to add to shareholder value. This point could be addressed once the results of

the benchmarking study are available. On the other hand, DMO sees its role as a rather intrusive form of interaction with ASC, seeking to exercise control and thereby discouraging ASC from taking an appropriate level of responsibility for outcomes. At the top level the relationship between the DMO and ASC was repeatedly described to us as having been, at least until recently, damaging. The Navy's contribution has been fragile in three regards: crewing, in not fully playing its part in discharging its responsibilities for maintenance, and for not supporting the supply chain properly. For its part, ASC has allowed its focus to become distracted from delivering timely, efficient and effective sustainment, and does not have an ingrained culture of continuous improvement, especially of equipment reliability. We explain these elements in more detail below but are already convinced that the best way forward should be to foster an Enterprise culture amongst the participants in which the focus of all should be the cost effective achievement of sensible availability goals, whilst not adversely impacting the value of the Government's investment in ASC. Implicit in this is the assumption that ASC should not provide services at sub-commercial terms, subsidising the Defence budget, but should suffer financial penalties for failure to perform. For ease of reference, we have referred to the four parts of what we hope will become 'the Enterprise' as 'the Participants'.

5.7 Acquisition and Sustainment

Ownership of a class of vessel falls into two phases. Each has a distinct character, but need to be carefully linked to ensure a smooth passage from acquisition (design, build, test and commission) to sustainment (maintain, operate, support logistically). The skill sets required in sustainment are quite different from those required for design and build: repairing the range of equipments in a submarine poses problems of access and control which are not likely to be experienced during build, and the design issues which crop up during sustainment are focused on keeping equipment operational rather than on design for performance. Many navies choose to keep the two phases apart by using different organisations and facilities. In the case of the Collins Class, the sustainment focus is in WA, except for the Full Cycle Dockings (FCDs) which last three years and take place in ASC Adelaide. The design capability which supports both sites is in Adelaide. The Adelaide operation, originally created to build the submarines, has thus had to transfer its skills from acquisition to sustainment, and the evidence suggests that this has not been wholly successful and that sustainment is still being treated as a 'poor relation' compared to the generally higher-profile acquisition work.

5.8 Authority, Accountability and Responsibility

We found many instances where accountability, authority and responsibility are misaligned, fragmented or simply not understood. For example, the Collins Class

Program Manager has no recognised authority outside his own program or the DMO, even though it is impossible to deliver sustainable submarine performance without this. Other examples of areas where this kind of problem exists include the supply chain, which suffers from an excessively complicated structure, engineering where RAN rules seem to allow multiple decision paths to exist, combat system engineering where responsibilities are fragmented, and overlap between the roles of numerous naval authorities.

There have been successive change initiatives in Defence, all of which seem to have added to the complexity of already complex structures, to the point where adequate levels of knowledge of the submarine domain no longer appear to exist. No amount of business process refinement could overcome this loss of expertise. A good balance between domain knowledge and business processes needs to be struck and this will take some time to achieve. Minor decisions of a 'tactical' nature tend to be escalated to very senior levels on the basis of information supplied by those at the bottom of the chain. As a result, those in the middle of the management chain can rarely add value. This unhappy scenario is only exacerbated by the glare of publicity; in WA we heard it described as micromanagement from afar. One particularly stark example we came across was a junior officer required to render a very detailed progress report every day which was sent to over 100 recipients.

Alignment of authority, accountability and responsibility is clearly an area which requires further work to develop detailed proposals for improvement in Phase 2.

5.9 Supply Chain

There are many complexities in the submarine supply chain as it is currently arranged. Stores are purchased for FCDs by the ASC, whereas DMO provide for all the activities in WA through their Naval Inventory Procurement Office (NIPO) based in Sydney. This leads to multiple handling of certain stores, many of which are procured through ASC, then have to go to NIPO before being delivered to the Naval Base and thence to the ASC in WA. We do not believe that this is a cost-efficient process. Placing a wider responsibility on ASC to supply submarine-specific stores to all sustainment activities seems to us to make sense. In any case we believe that a full analysis of the supply chain processes will yield significant benefit.

There are other issues to be addressed, such as the large and growing backlog of items awaiting repair in the Joint Logistics Unit (W), the inaccuracy of Ship Allowance Lists, the need for greater professionalism in stores management in the submarines themselves,

and the lack of interoperability between the RAN and ASC IT systems. One particular problem is the extent of 'cannibalisation' or 'storerob' (the removal of an item from one submarine to replace a defective one in another submarine with a higher operational priority). This runs at a very high level and is important because it both disguises the true lack of availability of spares whilst also causing a great deal of non-productive work to track the whereabouts of individual items, let alone the cost of removing and replacing the same component twice. In some cases the original equipment supplier no longer exists (such as for the diesel engines) and this creates a need to establish alternate sources or to carry out reverse engineering (the process by which original manufacturing techniques are re-established).

Recent figures indicate that around 85% of lost MRDs are due to operational or safety defects, and of those, about 45% are due to lack of stores. Around 15% of lost days are due to maintenance overrun. We therefore believe that achievement of availability will be considerably enhanced if the supply chain problems can be overcome.

5.10 Submarine Domain Knowledge

The modern submarine is a complex weapon system which also acts as a life support system and home to a crew of around 60; it has to survive perhaps the most testing environment for long periods of time and return safely. This places very particular and specific demands on those who act as owners and operators of submarines, in terms of the quality of leadership, integrity of their management, materiel and engineering systems, standards of work and training and overall awareness of the submarine environment. Success in managing a submarine project is thus crucially dependent on the level of domain knowledge. Whilst strong processes are also crucial to success they are no substitute for knowledge and experience. We are acutely aware on the basis of our evidence-gathering that submarine domain knowledge is thinly-spread across the participants, especially at the top; this is a cause for serious concern.

In Canberra, it is difficult to find more than a couple of individuals with any serious claim to submarine domain knowledge; in SA and WA the participants are critically dependant on a few key experienced individuals. Further, we were not shown plans for developing the level of knowledge, or for succession of key individuals. The impression we gained was of an organisation surviving from day to day, with no spare capacity to think about the future. Such a situation calls for the best possible leadership, both of the submarine branch of the RAN and of the other elements of the submarine participants. Without a clear plan to resolve this situation, it will be just a matter of time before the program grinds to a halt or the risk of a serious incident reaches unacceptable levels.

5.11 Navy Aspects

We were made aware by many of the interviewees of what is perceived as a long-running 'battle' within the RAN between the surface and submarine elements, and the difficulty this has caused for the submarine force. Even today, the submarine branch constitutes only a small proportion of the overall RAN in numbers of people; the fact that the Collins Class Program is now the biggest spender in sustainment terms has sharpened the debate, but has also begun to lead to a realisation that submarines need to be seen as very much a key part of the Service. With this must go a more pro-active approach to growing and maintaining the core of experience and competence which will allow the full capability of the Collins Class to be realised on a consistent and reliable basis. We believe that this process has been started with the recent creation of the DG Submarine Capability post which should enhance the Navy's capability management responsibilities, but wish to emphasise that it needs to be the subject of explicit and sustained effort from the top.

We understand, both from the Rizzo Report and from our work so far, that the RAN has failed to live up to its sustainment responsibilities over the last several years. This has affected both ships and submarines. We saw evidence that remedial action is in hand but the legacy is still there to be dealt with.

As has already been mentioned, the RAN has experienced problems in providing the necessary crews. We understand that the recommendations of the Submarine Workforce Sustainability Report (Moffitt, 2008) are being followed through, and that the RAN now has three full crews available. However, since the requirement is also widely interpreted as three submarines available for operations, this does not appear to allow for normal leave and training requirements and this may be a factor in poor retention of personnel once trained. Currently 33% of trained submariners have been qualified for less than two years – a worrying statistic. As a palliative measure, crews now hand over material control to ASC routinely at the beginning of all planned dockings, and transfer to another submarine. This works against the crew's sense of 'ownership' of its submarine, with very little maintenance work now being done by the crew (we heard it described as 'the hire car mentality'). It also raises other issues such as how the 'Commanding Officer' role is then discharged and how the transfer back to the RAN should be managed. As far as we have been able to ascertain, there is no plan to move back to the 'normal' arrangements for crewing, nor are we aware of the longer term plans for growing the submarine branch of the future. Crews are inexperienced and, with reduced availability, it is getting more difficult to achieve the required levels of training. With submarines having to live with defects of operational or safety significance, decisions on what to live with and what to return to harbour to fix are being made by inexperienced people; a

worrying feature with profound implications for safety. We wish to explore these issues further.

We are also concerned to find that the normal maintenance work (especially condition monitoring) assigned to the crew is not always being carried out, and that there appears to be no sanction applied for such failure. Evidence suggests that this has caused significant losses of submarine availability. Similarly, the failure of submarine personnel to provide adequate information on stores usage and the misuse of high priority channels for demanding stores have exacerbated the supply chain problems.

Finally, we are keen to explore the way in which submarines are programmed for operations. Long high-speed submerged passages can be particularly punishing for propulsion and other systems, and we need to establish the facts in this area and the extent to which the original design intent is taken into account.

5.12 The DMO

A theme which emerged repeatedly was the extent to which the DMO still adheres to the 'old' way of doing business, in which it tends to seek direct involvement in the whole range of technical and commercial decision-making at the tactical level. Examples are the DMO's involvement in approving ASC Work Instructions and the engineering authority's wish to adhere to the original Kockums design even for non-critical items such as minor fittings. We also sense that the engineering authority in DMO Adelaide may be seeking to act both as an acceptance authority and as a problem-solving organisation for ASC, leading to conflicts of interest.

Particularly for ASC, this approach by DMO has taken away the incentive to accept more risk and responsibility and, even in the current negotiations for the new ISSC (which is supposed to be creating a better set of behaviours) we were surprised to find the relationship still characterised (on both sides) as 'master/slave'. The emphasis on the ISSC as the vehicle for change in the relationship with ASC is understandable and may well be right, but we are concerned that the contract may be framed in overly 'legalistic' language which itself might drive the wrong behaviours, and that the new contract might distract from the need for people to behave in the right way regardless of which contract they are working under. We hope to have the opportunity to make some input to the transition phase of ISSC as a result of our Phase 2 work.

The DMO was formed by bringing together the previous acquisition and sustainment organisations, with the intention of creating a seamless transfer between the two regimes. Despite this well-intentioned move, sustainment remains a poor relation. The bulk of DMO sustainment staff is located in WA, whilst the acquisition community is

based principally in Canberra. The disposition of resources between Canberra, Fremantle and Adelaide appears to be unbalanced and the sustainment arm appears to be significantly under-resourced and will require review. The DMO needs to find a way to shift its focus more on to output and away from input, and as part of this, needs to see ASC as its Strategic Partner.

The DMO in responding to the material challenges of the Collins Class availability issues, has established a Collins Reform Program which encompasses a number of initiatives including, but not limited to the formation of the ASPO, the ISSC, the Integrated Master Schedule and focusing on supply chain, obsolescence management and reliability. All these activities are encouraging in seeking to address availability and reliability but are embryonic in nature and have yet to demonstrate a positive outcome. We welcome this initiative and will review its effectiveness in Phase 2.

5.13 The ASC

ASC suffers from having two Government Departments as key stakeholders; one as shareholder and the other as customer with potentially competing objectives. This is in contrast to DMO's relationship with privately-owned defence industry suppliers, where the relationships are at arm's length. This needs to be addressed early in order to provide the ASC management with the sort of clarity any commercial entity needs and would normally derive naturally from its place in the market. In particular the DMO/ASC contract needs to provide the right incentives for ASC to develop a performance-based culture.

Continued Government ownership of ASC is clearly a fundamental element in considering options for demonstrating value for money in sustainment activity and the supply chain arrangements. It is clear that the current arrangement lacks efficiency. In this respect we see our task as to survey other models for wholly or partly nationally-owned submarine businesses (such as DCN in France) and make recommendations which will allow the participants collectively to achieve the objectives.

There is no doubt that ASC can perform better, and this is acknowledged on all sides. There are some encouraging signs that management intends to embed a performance-based ethos, but the 'cost-plus' mentality developed under the current Through Life Support contract has been allowed to become deep-rooted and it will require sustained effort at all levels to change this. Changes in production of work packages and supply chains will be beneficial and need to be fully developed in SA, and have not yet started in WA. On the other hand, whenever initiatives are proposed which require 'seed' funding, the automatic response is to ask DMO for more money. The current practise of DMO funding, which is on an annual basis related to manpower levels, has a corrosive

effect on efficiency. It would be preferable to move towards the funding of each major task, such as an FCD, as this would allow productivity to be incentivized and would engender 'invest to save' decisions within a shareline arrangement.

There are some good points too. In WA we saw a very much better level of co-operation between ASC and the DMO and RAN; well-focused on the waterfront and operational needs. Given only a little encouragement, and greater freedom to operate under their own initiative, it seems likely that significant economies can be driven out by reducing overlap between the roles of all three main players. We also noted that ASC in WA is very open to out-sourcing a whole range of activities, a stark contrast to the picture we obtained from our visit to Adelaide. In Adelaide we saw some very good work to capture reliability data from a number of sources, then analyse it to determine how best to improve availability within a given level of resource. This type of work needs to be at the forefront of sustainment management, but appears not to be being given any particular priority.

Significant challenges will fall to the ASC once the ISSC has been signed. Amongst these is the requirement to focus on outputs, meeting new performance metrics and purchase of submarine spares with all of the attendant risks and cultural changes. We were not able to judge the preparedness of the ASC to meet these transformational changes and would recommend that this is fully considered in Phase 2.

It was always anticipated that the ASC's submarine sustainment structure would be benchmarked against international standards during Phase 2. The benchmarking task which ranks relative performance of the ASC (ranging across about 50 different benchmarking elements) has been separately contracted to First Maritime International (FMI) by the DMO for both the SA and WA sites. The review team has advised on the scope of the benchmarking prior to contract award. During the preparation of FMI's final report the Review Team will be actively engaged. FMI's final report is expected to be issued in December 2011.

Another aspect of the ASC that is recommended to be covered in Phase 2 is the degree to which there may be duplication of skills between the DSTO and the ASC. The Review Team understands need for the Commonwealth to be able to retain the necessary intellectual and manufacturing know how on submarines. What is less clear is what precisely these skills are and whether they are duplicated in other Commonwealth institutions, such as the DSTO. Elimination of unnecessary duplication would minimise overall resource consumption. We recommend that this area be explored in Phase 2.

The issue of ownership of intellectual property (IP) is clearly complex for ASC, given the history and the severed relationship with the original Design Authority. The Review Team recognises that this must create certain difficulties. We recommend that this area also be explored in Phase 2.

5.14 Key Suppliers

There is a range of key suppliers to the program beyond ASC itself. This list includes Raytheon (combat system integrator), Thales (sonar), Babcock (weapon launch and handling), Pacific Marine Batteries, Drive Train (diesels), BAES (optronics), and the US Navy (tactical command system). There are others who supply specialist products or services without which the program could not succeed. During Phase 1 we were only able to hold limited discussions with Raytheon and Pacific Marine Batteries; it is our intention to engage with other key suppliers during Phase 2.

We fully recognise the importance of these key suppliers to the Collins Class Program and believe that they have a great deal to offer in terms not only of their skills and products but also their ideas to improve matters more generally. During Phase 1 we have had to focus on some immediate issues which happen to lie mainly in the hull, mechanical and power electrical areas of the submarine; though we are aware of some big issues emerging in the combat and ship system areas. Of particular note is the issue of obsolescence which, 15 years into the program, has the potential to engulf the submarines with further problems if not adequately addressed. If this set of issues is not exactly as immediate as, for example, diesel engines, generator or motor issues, it is not far behind. We believe that it has been recognised, if rather late, and that some action is in hand. In Phase 2 we wish to look further at this.

We did not come across any structured approach to keeping these important stakeholders informed on what was going on in the program and gathering their feedback. It may be that we will propose the formation of a Key Suppliers Group for this purpose.

5.15 Asset Utilization

Over recent years the Collins Class Usage and Upkeep Cycle (UUC) has been re-cast in the light of operating experience. It appears that no account was taken of the longer term needs of the Class in making this change, and this may well have resulted in a UUC which is sub-optimal in a number of regards, most obviously in that it may be heading towards a crisis situation with too many submarines out of service. Consideration of issues such as resource levelling across RAN, DMO and Industry, opportunities for update and upgrade and the transition to the planned future submarine program should

result in a better return on investment whilst maximizing boat availability and capability. This is a further example of where a more 'strategic' approach would be appropriate.

At present the facility in WA carries out shorter-duration dockings only, whilst the SA facility performs the more major FCDs which currently take three years to complete. In the longer term, and especially in the context of a future submarine build program, it will be necessary to consider how to achieve the optimum balance between the WA and SA facilities to deliver efficiency and value-for-money whilst maintaining the ability to dock submarines at both locations. Concentrating all sustainment activity in WA would be likely to have clear benefits.

We were unable to establish why it is that FCDs take as long as three years, noting that the second FCD (HMAS FARNCOMB) took barely two years. Three years now seems to have been accepted as a 'given'. The corollary is that all the upgrade work tends to gravitate to FCDs, denying opportunities to improve capability outside of the eight year interval between FCDs. Carrying out deep maintenance is an expensive business and the cost per day of FCDs is considerably greater than that for lesser dockings. As part of Phase 2 we plan to look closely at these aspects as we believe a different UUC might yield significant benefits. We were surprised to be told that at no time were other UUCs evaluated for cost/availability/upgrade opportunities.

5.16 Program Management

In 2010 the senior management in Defence, realizing that a more co-ordinated approach was required, established the Australian Submarine Program Office (ASPO). Whilst this remains a 'virtual' office, overall management of the Collins Class, as a 'project of concern', has been placed under the management of a senior (2-star) official in the DMO. Importantly, an Integrated Master Schedule (IMS) has been produced which sets out key top-level milestone dates for the overall management of the program. Fifteen years into the program, this is a welcome and long-overdue initiative, although as yet it is not validated against supporting lower-level programs and therefore represents something of a 'wish list'. It is therefore more an expression of the requirement than a schedule for management of the overall program. Nevertheless a good discipline has been established which ties all the players in to a common endeavour. The IMS should be developed to a greater level of detail so that it can form the basis for the management tool for submarine sustainability and operations across the submarine enterprise. In parallel much good work has been done to establish a proper 'business case' approach to future funding submissions and to create a management structure designed to deliver sustainment, including update and upgrade, in a cohesive fashion. This is much-needed: at present there are several routes for 'projects' to come forward,

and it is difficult to obtain a clear view on the correct balance of resources to be applied. Funding of some important projects such as the Land Based Test Facility for the diesel engines (which is clearly of some considerable importance) has been sporadic. There is a need to do more to strengthen Program Management for the Class, for example in the use of risk management as a tool and in program planning.

5.17 Visits to Submarines and Facilities

We visited HMAS STIRLING, ASC Henderson, ASC Adelaide and Pacific Marine Batteries, Adelaide, as well as Government offices in Canberra. As part of this program we also visited HMAS DECHAINEUX, an operational submarine, and HMA Ships SHEEAN and RANKIN, which were at different stages of FCDs in Adelaide.

Throughout these visits we were impressed by the facilities themselves, and by the dedication and commitment of the people we met, even where it was obvious that there is considerable pressure and overload as a result of the overall state of the submarine program. Team spirit was particularly evident in WA, where all the immediate sustainment issues hit home: there is an excellent level of co-operation there between RAN, ASC and DMO elements and we feel sure that this is something to build on for the future. The operational submarine we visited was well-prepared for operations and impressed us with the pride and keenness of her crew.

In Adelaide the tempo is different. Full Cycle Dockings are three-year jobs, which is a long time even by modern nuclear submarine standards. It was not evident to us that there was any incentive to complete FCDs more quickly; perhaps, if they were completed faster, there would be an embarrassing knock-on effect on crewing, which inhibits the customer from demanding more. Relationships are mainly difficult and fractious, though there are also some good spots at the lower levels.

6 Definition of and factors affecting availability

6.1 The Operational Context

Australia's operational requirement is truly unique. Due to geography, her submarines have a need to be able to travel long distances dived across open oceans to reach their patrol areas. Whilst nuclear submarines would in general possess such a capability, Australia's decision to remain with conventional technology means that her national requirements are beyond what is available 'off-the-shelf' from international industry which generally produces small submarines optimised for inshore and coastal work, close to their bases. This was evidenced in the extent to which the original Kockums design had to be changed to meet the Collins Class requirement. It is therefore important to

acknowledge that, in setting a reasonable expectation for the operational availability of these submarines, account needs to be taken of this uniqueness.

6.2 Defining the operational requirement and the implications

Clearly, deciding what would be a reasonable operational availability target to set will not be straightforward. Despite the acknowledgement of the strategic nature of the submarine capability, we have been unable to identify any unanimity of view as to the actual requirement for submarine availability even at the most senior levels. There are many versions of the 'truth', depending on the particular role or viewpoint of the interviewee. From 'I want six boats in the water' to 'I want three in the green' to the very much more technical (and classified) readiness definitions used by the operators. Confusion reigns. As one of our correspondents commented, 'The Commonwealth is suffering from a confusion of objectives'.

One measure of availability used as the basis of the agreement between the RAN and DMO for availability is 'Material Ready Days'. With four of the submarines in the operational cycle, the target agreed for this measure is unachievable within the current UUC. This is due to the lack of contingency for unplanned unavailability, which we regard as being essential given the known problems with reliability, spares holdings and crewing. It yet remains the basis for reporting. A 'best endeavours' clause in the RAN/DMO agreement on availability promotes lack of clarity and of achievement. Failure to achieve availability goals has thus been institutionalised, leaving the program open to continued criticism.

There is a pressing need for a common view to be established of what it is reasonable to expect. Furthermore, there needs to be an understanding of the need for a level of contingency to be applied to the submarine program to allow for unplanned unavailability. Without this, unrealistic expectations of what can be achieved will continue, and the 'dud subs' story will continue to circulate. Generating the capability to deploy submarines on operations depends on a whole range of pre-requisites some of which relate to the material state of the submarine, whilst others attach to the state of training and preparedness of the crew which define the readiness state; a far more relevant metric. It is, however, important to note that a submarine can be in the required readiness state even if, on a particular day, it will only be available within a specified period of notice.

A clear target, which is affordable and is within the capability of an effective organisation to deliver, is, in our view, a pre-requisite. During Phase 2 we will seek to identify realistic, easily understood goals for availability and operational readiness which are reasonable, affordable and deliverable, within a continuous improvement framework.

6.3 Bench Marking Submarine Availability

The requirement for us to provide a series of international "norms" for use in determining what would be a realistic target to set is potentially of great benefit. However, the very success of submarine operations depends upon potential aggressors being unable to be certain that submarines will not be able to interfere with their intent. This means that foreign navies have to treat such information as classified and that they are unlikely to be willing to disclose the details of what they are currently achieving. Despite this potential difficulty, and the fact that the Australian operational requirement is so very different from that of other navies, we will endeavour to identify information which might support the recommendation of a realistic target for Australia.

7 SUMMARY OF OUR FINDINGS

The Terms of Reference focus on providing benchmarks to allow the Commonwealth to better manage the Collins Class sustainment through an understanding of what is and is not likely to be achievable. Any approach which offered the chance of demonstrating a reasonable level of availability is clearly highly desirable, given the history and current situation. However, as the Terms of Reference acknowledge, we found that it was less and less possible to confine our attention to submarine availability and industrial performance targets alone since it was so clear that there were many other issues in play, which all added to the overall picture. As reported above, these ranged from the lack of a strategic approach, weakness in the Navy's submarine ownership role and confused responsibilities and accountabilities, to lack of submarine knowledge and experience. More significantly, our attention was drawn to the behaviours and relationships at all levels and especially between the DMO and ASC as well as the lack of co-operation between the two Departments. This has taken the form of senior management rewarding the wrong behaviours, engineers not communicating effectively, entrenchment and risk aversion. Taking these findings together, we found the disparate organisation to be unfit for purpose. Recovery will demand a very serious and concentrated effort to change relationships for the better. This will be a major undertaking which goes well beyond anything the team expected to find, and which can only in the end be fully carried through by the participants working together as an Enterprise.

The Collins Class is the highest value Defence asset in terms of sustainment budget (~$440M this year) and is required to provide an essential strategic capability. It is a hugely complex and difficult asset to manage. The DMO, ASC and the RAN have all taken some steps to address the sustainment of the Collins Class. For the DMO this is captured principally in the Collins Reform Program, for the Navy the creation of the new Director General Submarine Capability post, and for the ASC, some encouraging signs of

improved management in WA and material support to FCDs. It is our firm view that a much greater recognition of the need for empowered program management, at the right level and with explicit and carefully defined authority from the very top across the participants as a whole, is required to deliver this strategic capability and we intend to conduct a detailed exploration of the possibilities in Phase 2.

The story of the Collins Class does, however, have a positive side. The scale of the achievement to acquire and build these highly capable submarines is recognised internationally. These achievements give us every confidence that Australia can and will achieve success in owning and operating at reasonable cost a fleet of sophisticated and capable submarines fully capable of protecting her maritime interests.

8 PROPOSALS FOR PHASE 2

8.1 Moving from Phase 1 to Phase 2

The Terms of Reference require a 'detailed and structured scope of work with an accurate cost and schedule for its execution' as the outcome of this phase. As we progressed through Phase 1 it became clear to us that the scope of work necessary to support fully the overall objectives of the review was significantly greater than that originally envisaged by ourselves or our Sponsors. Our analysis of the issues arising from Phase 1 showed that a number of workstreams each containing a number of strands of activity would be needed to fully answer the need to arrive at an 'efficient submarine sustainment business'. Taken overall this would represent a very large program of change, though there are certainly options for some of the work to be started early in order to deliver results ahead of the main body of change. To manage such a program effectively requires the skills and resources of a company which is expert in change management rather than submarine sustainment, though there will remain an absolute need for the latter to ensure that the work is correctly focused.

We have been able to produce an outline plan for Phase 2 based on the workstreams identified from Phase 1 but, given the expanded scope of work, we have not been able to develop the level of detail necessary to support accurate costing of Phase 2 in the timeframe allowed. In order to provide the Commonwealth with a reasonable range of options and the fidelity it requires to move forward, we now need to engage in dialogue with candidate change management experts.

Prior to writing up the Phase 1 report discussions took place leading to an informal agreement of the need for an interim phase of work in order to identify options for the way ahead in sufficient detail to allow an agreed scope and timetable to be agreed as a basis for negotiating the contract for Phase 2.

8.2 The Interim Phase

The purpose of the Interim Phase is to produce the required cost and schedule for Phase 2. The outline plan for Phase 2 will be used as the basis for a selection process leading to the choice of a partner company based in Australia. This company will be required to provide a project manager who is appropriately skilled and acceptable to the Review Team, from a company which is capable of providing, either organically or by sub-contract, the necessary resources and skills to undertake those parts of Phase 2 which are not either being worked on by the Review Team members themselves, or where it is agreed that the Commonwealth and ASC themselves can provide suitable resources.

Once selected, the project manager's immediate task during the Interim Phase will be to provide a detailed statement and program of work, together with resource requirements and costs. This plan will be subject to scrutiny by members of the Review Team as well as by Commonwealth representatives to ensure that it will meet the Phase 2 remit, before it is put before the ASC Steering Committee. The vehicle for its approval will be a report covering the Interim Phase deliverables.

It is planned that the Interim Phase will last six weeks from the acceptance of this report by the ASC Steering Committee. A full description of the Interim Phase, its cost, deliverables and the arrangements for its management are at Annex E.

8.3 Scope of Phase 2

The proposed outline program of work for Phase 2 is detailed at Annex F. This is a comprehensive program necessary to establish evidence based recommendations for successful sustainment and associated management for the Collins Class, leading to improved availability and reliability. Four work streams are proposed, each covering defined outputs with key responsibilities

Integration and Program Management

Leadership and Governance. To manage the work streams and integrate outputs. To manage the program governance arrangements and stakeholders to provide program coherence and acceptance.
Program Management. To assess the current program management capabilities and structure of ASPO and make recommendations as to remedial actions necessary to achieve an optimum position.

Commercial

Industry Analysis. To analyse, understand and map the relevant industrial supply base and the to conduct a Supply Chain Vulnerability study
Contracts Analysis. To map the contractual landscape, and analyse current commercial mechanisms and structures to determine the opportunity and appetite for refinement and optimisation of commercial arrangements.

Engineering, Reliability and Navy

Operating Model and Benchmarking. To determine an optimal operating model by undertaking benchmarking of operations at ASC to determine reasonable and realistic performance standards across the participants operating.
Reliability. To define optimal approaches to engineering processes, structures and required skills and competencies across the enterprise.
Navy Sustainability. To analyse the current challenges/constraints faced by the Navy in sustaining Submarine branch capability – making recommendations as to remedial actions to achieve an optimum position

Costing

Cost and baseline. To undertake a high level base lining exercise to identify funding pots, the transactional flow, and the relationship between costs and operational drivers, to enable the design of an Enterprise Cost Model.

Other areas which may require study are listed in paragraph 4.4 and could be added if required.

8.4 Management of Phase 2

On the assumption that the general approach outlined above is acceptable, management arrangements will need to be put in place to ensure that Phase 2 work remains on track and that it delivers the required outcomes. We also believe that it will be of key importance to ensure that the Participants are fully engaged in all the Phase 2 work in order that the transition out of Phase 2/3 into a longer-term change program can be smooth, and effective, with a good level of 'ownership' by all the participants.

Annex F shows a proposed management structure in which the project manager works closely with the review team, acting as a 'steering committee'. We hope that mechanisms will also be put in place to allow the participants to contribute to the

management of Phase 2 both at this 'steering committee' level and also at the level of a Steering Group, representing the interests of the Sponsors and ASC.

A model for such a set of management arrangements could be:

a. A Steering Group (CN, CEO DMO, DepSecDoFD, Chairman of ASC) to provide governance, finance and oversight of Phase 2 and to receive the Phase 2 Report.

b. We strongly recommend joint DoD-DoFD (via ASC) funding for this phase in order to ensure a joint approach is maintained.

c. The Review Team will operate under contract to the CoA via BMT and act as the Executive.

d. A Project Manager from a company under contract to the CoA via BMT will report to and work with the review team, and will be tasked:

   i. to select the right people with skill sets matching the requirements for each workstream.
   ii. to ensure delivery and compliance against the detailed plan for Phase 2.

e. At the level of the 'steering committee' the review team and the project manager will hold monthly briefs for key stakeholders (the 'Key Stakeholder Group');

f. Key stakeholders include: ASC (CEO), RAN (DGSMC), DMO (PMC&W), DoFD (FAS);

g. It is recommended that the Key Stakeholder Group take over control of the Change Program from the Executive on completion of Phase 3.

h. A Key Suppliers Group including, but not limited to, Raytheon, BAES, Thales, Babcock, Pacific Marine Batteries to be briefed monthly.

9 Conclusions

Our findings during Phase 1 have directed our attention towards the need for a wider change-based program if the submarine sustainment business is to be made fit for purpose; such a program of work will also deliver the other objectives of the review as set out in the Terms of Reference. Given the increased scale of the task envisaged, more work is now needed to set up and scope the arrangements for Phase 2 in sufficient detail to meet the Commonwealth's need for a detailed scope of work, with an accurate cost and schedule. This will require an interim phase of work which will allow the required level of detail to be worked up together with options for the way in which the overall task

is framed and approached. It is therefore planned, subject to approval by the Sponsors, that work now commence on the interim phase of work as set out in detail in Annex E. Certain commercial information, such as cost information is commercially confidential and has been provided under separate cover.

We conclude that the sponsors of this study face a stark choice. They must either accept the challenge and recognise the need to embrace some far-reaching and fundamental changes in their organisations and behaviours to improve availability, or tailor the submarine availability target to something that is within the current organisations' capability to provide. Tinkering around the edges will not do; at best it might provide the impression that things might improve, at worst the availability levels could sink even further. Asking more from an ineffective organisation without fundamental reform could well make things worse. We have asked the question as to why our recommendations should be any more likely to be implemented than those from previous reviews, and were left in no doubt as to the genuine desire of Ministers and our sponsors for this independent review to establish the facts and to act on our recommendations.

From what we have seen and heard, it is clear to us that delivery of reasonable levels of availability can be achieved at reasonable cost. Given the right degree of commitment and leadership, allied with the right operational tempo, and the development of an "Enterprise Culture", there is no reason why the Commonwealth should not be able to field a credible and cost effective strategic submarine capability that is capable of development and expansion.

10 List of Annexes

- Annex A – Terms of Reference
- Annex B - CVs of Review Team
- Annex C – Code of conduct
- Annex D – Mind Map
- Annex E – Interim Phase Proposal[2]
- Annex F - Outline program of work for Phase 2
- Annex G – Terminology and Acronyms

[2] Certain deliverables, such as commercial aspects and cost information are commercially confidential and have been provided under separate cover.

STUDY INTO THE BUSINESS OF SUSTAINING AUSTRALIA'S STRATEGIC COLLINS CLASS SUBMARINE CAPABILITY

TERMS OF REFERENCE

1 AUTHORISATION

1.1 The Secretary of Defence, Chief of the Defence Force and Secretary of Finance and Deregulation have commissioned this benchmarking study as part of the work program of the Government-ASC Steering Committee overseeing issues relating to Collins Class Submarine (CCSM) sustainment requiring whole-of-government consideration.

2 PURPOSE

2.1 The purpose of these Terms of Reference is to specify the scope of the benchmarking study into the optimal arrangements for CCSM sustainment.

3 CONTEXT

3.1 Established in 1985, ASC Pty Ltd (ASC) was chosen in 1987 to design and build the six CCSMs and contracted in 2003 to deliver submarine through life support, and in 2005 a subsidiary of ASC was awarded the shipbuilder role for the Hobart Class Air Warfare Destroyer (AWD). ASC is therefore a nationally strategic industry asset for Australia, providing critical capability in support of the Royal Australian Navy (RAN).

3.2 ASC, as a Government Business Enterprise (GBE), is both owned by the Australian Government, and for CCSMs, is a sole Industry Partner/Supplier to Defence in a monopsonist relationship. These circumstances are unique in comparison to Defence's other dealings with commercial entities. This uniqueness needs to be recognised and brings significant challenges.

3.3 ASC is a proprietary company, incorporated under the Corporations Act 2001, and is prescribed as a GBE under the Commonwealth Authorities and Companies Act 1997. Under this commercial framework ASC is required to operate and price efficiently, earn a commercial rate of return and comply with the Commonwealth's Competitive Neutrality Policy.

3.4 In 2003 Defence established a long term Through Life Support Agreement (TLSA) with ASC for the sustainment of the CCSM. TLSA is essentially a cost-reimbursable, limited performance-incentive contract with annual negotiation of budget and work scope. Defence engages mission system contractors separately and provides materials as Government Furnished Equipment for in-service CCSMs.

3.5 In 2008, in response to an indication by the then Government that ASC would be privatised, Defence sought to renegotiate the TLSA to reflect industry best practice arrangements, including recognition of the need for ASC to undertake incremental improvement and, with increasing levels of maturity, risk transfer and accountability for outcomes.

3.6 Since 2009 a range of Collins program reform initiatives have been ongoing including the establishment of the Australian Submarine Program Office, collaboration between the RAN, DMO and ASC, agreement on the Integrated Master Schedule (IMS) and negotiation of a

performance-based In-Service Support Contract (ISSC) with ASC. A critical aspect of the ISSC is the establishment of appropriate business arrangements and performance parameters to benchmark CCSM sustainment to ensure the whole-of-government objectives are met.

3.7 ASC wishes to identify world best practice goals in order to establish objective benchmarks against which it can demonstrate its improvements and compliance.

3.8 Defence wishes to ensure that the required availability of reliable submarines is delivered to the RAN through the CCSM Integrated Master Schedule at an affordable price and represents value for money.

3.9 A joint aim of Defence and ASC under the ISSC is to enhance the national submarine sustainment industry through stronger engagement and utilisation of a wider industry base with a best of breed 'Make – Buy' approach which aims to provide long term efficiencies and value for money. The key principles aligned to these outcomes and arrangements are captured in an ISSC Heads of Agreement between Defence and ASC now used to guide the detailed contract negotiations.

4 OBJECTIVES AND SCOPE

4.1 The broad objectives for this review are to determine:

- the optimal commercial arrangements between Defence and ASC to support the delivery of efficient and effective CCSM sustainment, which will be used to guide the ongoing development of the ISSC commercial framework;
- the appropriate performance goals for sustainment activity, based on world best practice efficiency and effectiveness benchmarks;
- options for demonstrating value for money in sustainment activity and the supply chain arrangements;
- opportunities for improvements in management arrangements between ASC, DMO and the RAN to achieve an efficient submarine sustainment business;
- future infrastructure needs to support the submarine sustainment activity;
- measures to be implemented by DMO and the RAN to ensure that ASC is able to operate under a performance-based contract; and
- the subsequent priorities for ASC, DMO and the RAN reform to effect greatest improvement, given time, budget and system constraints.

4.2 It is not intended that this review examine or make recommendations regarding ASC's overall governance framework, but rather the commercial and contractual arrangements for submarine sustainment between ASC and DMO.

5 METHOD OF CONDUCT

5.1 This study will be conducted in four phases:

- Phase 1 Mobilisation, scoping analysis and planning – It is proposed to engage the review team on a not to exceed time and materials contract arrangement to undertake the development of the detailed statement of work, deliverables, schedule and planning arrangements through initial consultation between the proposed review team, Defence, Finance and Deregulation and ASC. The outcome of this phase will be a detailed and structured scope of work, to be reviewed by the Government-ASC Steering Committee, with an accurate cost and schedule for its execution. This will form the basis of a contract amendment to complete the main body of the review.
- Phase 2 Data collection, analysis, option and implementation strategy development and interim recommendations – This phase will be based upon the detailed statement of work, deliverables and schedule developed during Phase 1. A key outcome of this phase will be a framework and industry best practice benchmarks against which DMO, the RAN and ASC performance in delivering CCSM sustainment can be assessed.

- Phase 3 Final Report and recommendations – This phase will enable the review team to take feedback and incorporate further clarification to the findings and recommendations based upon the review of the Interim Report by Defence, Finance and Deregulation and ASC.
- Phase 4 Follow Up Review, Analysis and Recommendations – This phase will enable the review team to undertake a progress review of the transition to the new ISSC and assessment of performance against the recommended framework and industry best practice benchmarks.

6 TIMING

6.1 The initial phase of the study will commence early in the third quarter 2011 to establish and agree the detailed scope of the tasking, establish the planning framework, team administration and support arrangements.

6.2 The main body of work is expected to be conducted during the third and fourth quarter of 2011 with an interim report for consideration by the Government-ASC Steering Committee to be received by December 2011 and final Report for consideration by the Government-ASC Steering Committee by March 2012.

6.3 A follow up review will be scheduled for the second and third quarter 2012 to coincide with preparations to transition the ISSC into a more mature and robust performance based arrangement.

7 SPECIFIC DELIVERABLES

7.1 The deliverables from Phase 1 of the review will be a detailed statement of work, outline of proposed deliverables, review schedule, administrative framework and a supporting cost estimate for the conduct of Phase 2, 3 and 4.

7.2 Other deliverables will be specified as a result of the contract amendment to incorporate the outcomes from Phase 1 of the review.

8 SIGNATURES

Secretary of Defence	Chief of the Defence Force	Secretary of Finance & Deregulation

August 2011

ANNEX B

CV's of the Review Team

John Coles CB FREng.

John became a Naval Constructor in 1971 and undertook assignments associated with the acquisition of ships and submarines (until 1978); he was reassigned to Fleet Headquarters on the staff of the Flag Officer Submarine (1978-81) and appointed to Electric Boat, New London Connecticut (1982-85) and later the Design and Acquisition Manager (1988 -91) for the Vanguard Class. Following promotion to the Senior Civil Service in 1992 he became the Project Director for major Infrastructure Projects to support the Vanguard Class and attended the RCDS in 1994. On completion he became the Superintendent Ships at Devonport (1995-97) undertaking the contract management for ships and submarines repair, and infrastructure projects. He became the Chief Executive of the Ship Support Agency in 1997 and later the Chief Executive of the Warship Support Agency – the latter responsible for the materiel support of all RN ships and submarines their equipment, weapons systems and the Naval Bases. Following retirement in 2005 he was re-engaged as the Project Director for the CVF (2005-2007). John holds a BSc and MSC from ULC, an honorary doctorate from Bath University, elected a Fellow of the Royal Academy of Engineering, was awarded a CB, and a former head of the RCNC. He now runs his own consultancy.

Commodore Paul Greenfield RAN Retd AM MBA MIEAust

Paul spent 32 years in the Royal Australian Navy as a weapons electrical engineer. After sea service in both surface ships and conventional submarines he undertook contract management for major ship repairs in Western Australia (1987-92). He subsequently became the Project Director's Representative in Adelaide during sea trials for the submarines HMAS COLLINS and HMAS FARNCOMB and in 1997 the Chief Staff Officer (Engineering) to the Fleet Commander. Paul joined Dr Malcolm McIntosh and Mr John Prescott as an advisor during their independent review of the Collins Class submarines and was promoted to Commodore as Director General Submarines for the subsequent recovery program, including the negotiation and delivery of the two 'fast track' submarines. As Director General Maritime Development he helped to develop the acquisition strategy for the Air Warfare Destroyer to fit the US Navy's *Aegis* Air Warfare system. Following retirement in 2005 he became an independent consultant. Paul was awarded a BE from the University of Queensland and an MBA from the University of New South Wales. He was admitted as a member of the Order of Australia in 2004.

Rear Admiral Fred Scourse RN Retd CB MBE FREng

Fred spent 35 years in the Royal Navy as an engineer officer. During the first half of his career he served in nuclear submarines both as a propulsion watch keeper and as a weapons specialist. Later he specialized in acquisition, playing a key role in the early part of the UK's successful Trident program and supporting the Chief of Defence Procurement in a major acquisition reform program. He spent 8 years as a Director-General in procurement of surface weapons and surface ships, completing his naval career as Controller of the Navy in 1997. Since then he has been active as a consultant and is an accredited High Risk/Mission Critical Gateway Review Team Leader in which role he has lead reviews of a number of major UK Government programs in a variety of Departments. Fred holds an MA from Cambridge University is a Fellow of the Royal Academy of Engineering. Fred was awarded an MBE as a Lieutenant RN and later a CB.

Arthur Fisher C Eng MIEE

Arthur has enjoyed a successful 31-year career in UK MoD as a civilian professional engineer followed by an active career as a consultant as an agent of change. Whilst working with the MoD he undertook assignments associated with the development acquisition and support of sonar and combat systems and as an IPT leader for the support and acquisition of the Type 23 frigates. He has also managed significant change programmes including privatisation of the former Royal Dockyards, supply chain (storage and distribution), Warship Support and Modernisation (the integration of contractor and naval personnel engaged in sustainment for both submarines and surface ships) and establishment of the Submarine Support Management Group through comprehensive restructuring of contracted out engineering advice to achieve improved levels of service through performance based contracting. As a self-employed consultant Arthur has provided support to the UK MoD's Maritime Change Program for both the surface ship and submarine, as well as advising the Army Recruitment Partnering Project and the Land Change Programme including Maritime Docks and Ports.

Annex C

COLLINS CLASS INDEPENDENT REVIEW

Phase 1 – Code of Conduct

1. The objective of the Review Team will be to provide the Commonwealth with the frankest, clearest and most robust set of recommendations possible in order to help those involved to achieve a better set of outcomes from the investment in the Collins Class. The focus will be on moving forward, and the past will be examined only as much as necessary to inform forward-looking, realistically-achievable recommendations.

2. All recommendations will be consistent with the team's findings and will be evidence-based.

3. Interviews will be conducted on a non-attributable and confidential basis. This will encourage interviewees to be open and honest which in turn will allow the team to penetrate the issues more quickly and accurately, and avoid the review acquiring 'inquisition' or 'audit' status.

4. Team members will pool their experience and work together to ensure that the Review is both effective and efficient.

5. The Review Team will adopt a 'partnering' style with key stakeholders.

6. The 'Owner' will manage the receipt, dissemination of and responses to the reports produced by the Review Team. Whilst the reports will stand on their own as outputs from an independent review process, the Commonwealth will be free to accept, reject or modify recommendations made in the Final Report.

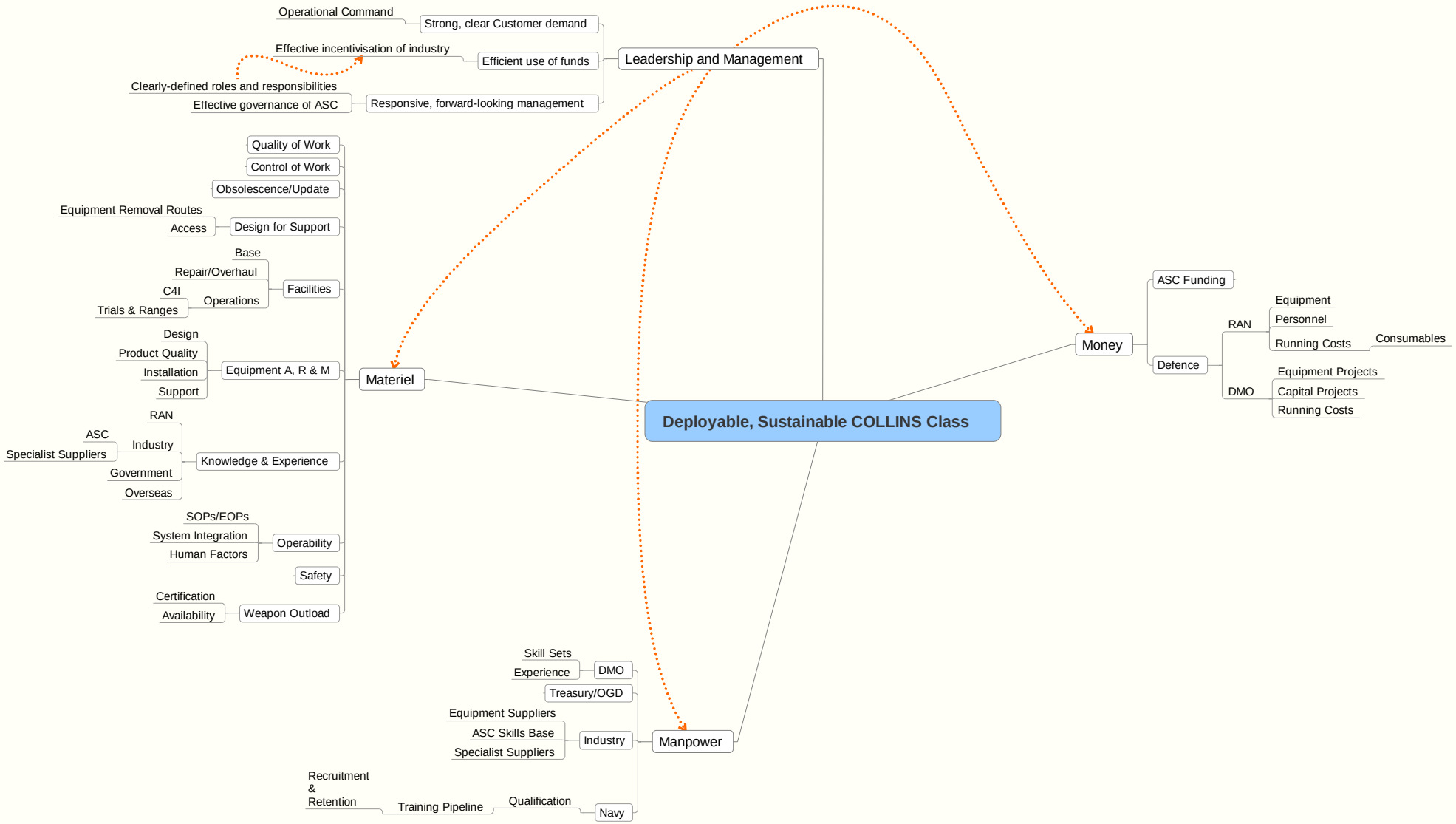
ANNEX D

SUBMARINE AVAILABILITY ‘MIND MAP’

A mind map is a diagram used to represent words, ideas, tasks, or other items linked to and arranged around a central key word or idea. In this case the subject is submarine operational availability.

Prior to starting our work in Australia, we pooled our thinking about what the elements are and which go together to provide effective sustainment to submarines. This exercise resulted in the attached mind map, which we then used during the review to check that we were covering all the relevant aspects, or to decide which areas did not need to be reviewed at this stage.

Annex D


Deployable, Sustainable COLLINS Class
Leadership and Management
Operational Command
Strong, clear Customer demand
Effective incentivisation of industry
Efficient use of funds
Clearly-defined roles and responsibilities
Effective governance of ASC
Responsive, forward-looking management
Materiel
Quality of Work
Control of Work
Obsolescence/Update
Equipment Removal Routes
Access
Design for Support
Base
Repair/Overhaul
C4I
Operations
Trials & Ranges
Facilities
Design
Product Quality
Installation
Support
Equipment A, R & M
RAN
ASC
Specialist Suppliers
Industry
Government
Overseas
Knowledge & Experience
SOPs/EOPs
System Integration
Human Factors
Operability
Safety
Certification
Availability
Weapon Outload
Money
ASC Funding
Defence
RAN
Equipment
Personnel
Running Costs
Consumables
DMO
Equipment Projects
Capital Projects
Running Costs
Manpower
Skill Sets
Experience
DMO
Treasury/OGD
Equipment Suppliers
ASC Skills Base
Specialist Suppliers
Industry
Recruitment
&
Retention
Training Pipeline
Qualification
Navy

Annex E

COLLINS CLASS INDEPENDENT REVIEW

Interim Phase Proposal

1. BACKGROUND

1.1 The Australian Secretary of Defence, Chief of the Defence Force and Secretary of Finance and Deregulation have commissioned the Coles' Review as part of the work program of the ASC Steering Committee overseeing issues relating to Collins Class Submarine (CCSM) sustainment requiring whole-of-government consideration.

1.2 The Australian Defence Department wishes to ensure that the required availability of reliable submarines is delivered to the RAN through the CCSM Integrated Master Schedule at an affordable price and represents value for money.

1.3 The review is one of a number of reviews into Australian Defence Acquisition that have been or are being undertaken.

1.4 Phase 1 of the Review has completed. It identified the need for a more wide ranging Phase 2 than previously anticipated. This will include consideration of:

a. Assessment of current program management capabilities and structures;

b. Analysis and mapping of the industrial supply base;

c. Development of an optimal operating model for ASC and the RAN Submarine Branch;

d. Development of a cost model.

1.5 This work will require the appointment of a company with the capability to undertake a significant proportion of the work and manage the integration of their work with the work of the Team and work that will be undertaken by DMO, RAN and ASC.

1.6 The Interim Phase is required to enable a fully detailed and structured scope of work for Phase 2 to be produced with an accurate cost and schedule for its execution.

2. APPROACH

2.1 The Interim Phase will include:

a. Identification and selection of a company with the capability to undertake a significant proportion of the work required during Phase 2 and manage the integration of their work with the work of the Team and work that will be undertaken by DMO, RAN and ASC

b. Development of detailed plans and schedule of work for Phase 2

c. Determination of accurate cost for Phase 2.

2.2 To identify and select the company the team will invite potential bidders to a Bidders' Conference at which the requirement will be explained. Bidders will be invited to submit proposals for the management and conduct of the work with particular reference to the integration of their work with the work of the team, DMO, RAN and ASC. During the preparation of proposals the bidders will need to engage with the team, DMO, RAN and ASC to agree responsibilities and management arrangements to best achieve the objectives of Phase 2.

2.3 The Team will recommend to BMT D&T the company to be engaged by BMT D&T for Phase 2, subject to DMO approval, based on a review of the submitted proposals and a formal interview. DMO will be invited to provide an input to this selection process.

2.4 Following selection the Team will work with the selected company to refine the detailed roles and responsibilities, management arrangements and schedule for Phase 2. DMO, RAN and ASC will be engaged in these discussions. Once agreement has been reached a formal costed proposal for Phase 2 will be submitted for approval

3. SCHEDULE

3.1 An initial schedule for the Interim Phase has been developed. This will be subject to further refinement and amendment in the light of feedback on the Phase 1 Report.

Interim Phase Approved	by Tue 18/10/11
Identify Potential Bidders	by Tue 25/10/11
Issue Bidders Conference Invites	Wed 26/10/11
Present Final Phase 1 Report	Thu 27/10/11
Phase 1 and Interim Phase discussions	Fri 28/10/11 - Wed 02/11/11

Prepare Bidders Conference Brief	Thu 03/11/11 - Fri 04/11/11
Bidders Conference	Mon 07/11/11
Bidders Prepare Proposals	Tue 08/11/11 - Mon 28/11/11
Bidders engage with Team, DMO, RAN, ASC	
Proposals Submitted	Mon 28/11/11
Review Proposals	Tue 29/11/11 - Mon 05/12/11
Bidder Interviews	Tue 06/12/11
Announce Contractor	Wed 07/12/11
Refine Bidders Plans	Wed 07/12/11 - Tue 13/12/11
Engage with Team, DMO, RAN, ASC	
Prepare Phase 2 Proposal	Mon 12/12/11 - Fri 16/12/11
Submit Phase 2 Proposal	Mon 19/12/11

3.2 The commencement of work assumes completion of Phase 1 as planned with no significant comments on the proposal included in the draft report. The timing of the submission of the Phase 2 proposal will be determined by the quality of the proposals and the time required to refine the selected proposal in consultation with DMO, RAN and ASC. It is considered essential that all parties are fully engaged in Phase 2 and hence that there is agreement on ways of working prior to commencing Phase 2.

4. TEAM MEMBERS

4.1 The team to undertake this Interim Phase will consist of the following persons:

a. Dr John Coles - Review Team Leader.

b. Mr Fred Scourse.

c. Mr Paul Greenfield.

4.2 The Team will be supported in UK by BMT Defence Services Ltd

4.3 The Team will be supported in Australia by BMT D&T personnel who will provide contract administration and the formal contract interface with the client. The point of contact will be Ms Samantha Tait.

4.4 The Team will also require support and assistance from DMO.

5. SUPPORT REQUIREMENTS

5.1 The successful and timely completion of this task is dependent on the following support being provided:

a. DMO, RAN and ASC engagement in discussions to agree possible work share for Phase 2 as an input to Bidders Conference;

b. DMO, RAN and ASC prompt response to questions and requests for discussions by bidders during proposal preparation;

c. DMO, RAN and ASC engagement in discussions to refine proposals for Phase 2.

6. DELIVERABLES

6.1 The deliverable from the Interim Phase will be a proposal for Phase 2 covering:

a. Work proposed to develop improved framework for management of sustainment of Collins Class Submarines including identification of best industry practice and development of proposals;

b. Schedule of work for Phase 2;

c. Proposals for management of Phase 2;

d. Definition of Deliverables from Phase 2;

e. Cost estimate for Phase 2.

6.2 The Proposal will be submitted to the Director General Collins Acquisition Program. Subsequent discussion of the proposal with the Team will be by telephone conference between Australia and UK.

6.3 A formal commercial proposal reflecting this Annex will be submitted to DMO by DMT Design & Technology

Collins Class Sustainment Review – Annex F

Phase 2 – Initial Plan (Draft)

September 2011

Overview of Phase 2

Purpose and objectives of Phase of work

To enable a process of fundamental improvement in the sustainability of the Collins Class submarine through the delivery of evidence based recommendations focused on identifying actions and activities to initiate the following:

- An understanding and agreement of a reasonable and realistic requirement with regard to availability and reliability.
- An enterprise wide industrial strategy to achieve an optimised commercial position for the Australian Govt whilst maintaining a sustainable E2E supply chain.
- An affordable and cost effective VfM solution.

Workstreams

Integration & Prog Mgmt

- Leadership & Governance
- Program Mgmt

Commercial

- Industry Analysis
- Contracts Analysis

Engineering, Reliability & Navy

- Operating Model & Benchmarking
- Reliability
- Navy Sustainability

Costing

- Cost and Baseline analysis

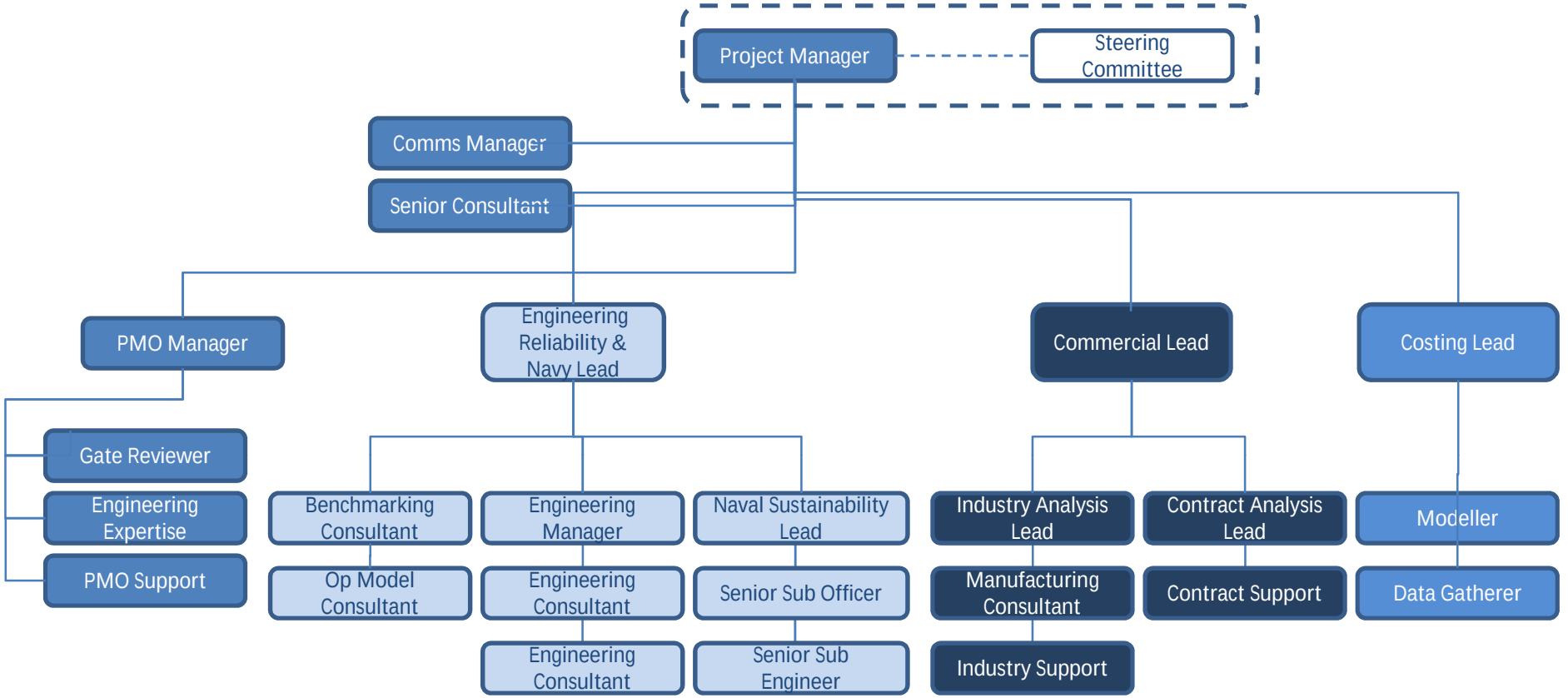
Workstream Summary

	Workstream	Key Responsibilities
Integration and Program Mgmt	Leadership & Governance	To manage the workstreams and integrate outputs. To manage the program governance arrangements and stakeholders to provide program coherence and acceptance.
	Program Management	To assess the current program management capabilities and structure of ASPO and make recommendations as to remedial actions necessary to achieve an optimum position.

	Workstream	Key Responsibilities
Commercial	Industry Analysis	To analyse, understand and map the relevant industrial supply base to conduct a Supply Chain Vulnerability study
	Contracts Analysis	To map the contractual landscape, and analyse current commercial mechanisms and structures to determine the opportunity and appetite for refinement and optimisation of commercial arrangements.

	Workstream	Key Responsibilities
Engineering Reliability & Navy	Operating Model & Benchmarking	To determine an optimal operating model by undertaking benchmarking of operations at ASC to determine reasonable and realistic performance standards across the enterprise.
	Reliability	To define optimal approaches to engineering processes, structures and required skills and competencies across the enterprise.
	Navy Sustainability	To analyse the current challenges/constraints faced by the Navy in sustaining Submarine branch capability – making recommendations as to remedial actions to achieve an optimum position
Costing	Workstream	Key Responsibilities
	Cost and Baseline	To undertake a high level baselining exercise to identify funding pots, the transactional flow, and the relationship between costs and operational drivers to enable design of an Enterprise Cost Model.

Delivery Team



Workstream: Integration and Program Management

Workstream		Objectives	MONTH 1 (Wk 1-4)	MONTH 2 (Wk 5-9)	MONTH 3 (Wk 10-13)	MONTH 4 (Wk 14-18)	MONTH 5 (Wk 19-22)	Outputs & Deliverables
Integration & Project Management	Leadership & Governance	• To ensure a consistent and coherent overall framework within which the sustainability and performance management programs can be implemented.	Agree scope		Emerging Findings	Produce Strategy and Plan for embedding roles and responsibilities across the Submarine Enterprise	Final Report	• Consolidated report and capping paper for all relevant workstream outputs – including recommendations and next steps and future plans.
		• To define and implement a stakeholder management strategy to understand roles and responsibilities of stakeholders	Develop stakeholder map	Engage with stakeholders		Identify potential future roles and responsibilities		• Detailed stakeholder map – current and potential future roles and responsibilities of individuals and organisations.
		• To define the overall strategy and plan for embedding the necessary changes across the Submarine Enterprise holistically		Clarify and develop roles and responsibilities for key stakeholders				• Understand potential for Strategic Partnering
		• To manage and integrate outputs from all workstreams to ensure consistency in the strategic direction of recommendations.	Investigate and establish requirement for the capability			Examine opportunities for Strategic Partners in the Submarine Enterprise		• Communication Strategy • Project Risk Management Strategy
			Examine the role of ASC in the Submarine Enterprise					
			Program Management of other workstream activities and deliverables					
			Design Comms Strategy	Implement Comms Strategy				
	Program Management	• To assess the current ASPO's ability to operate as an effective PM mechanism to achieve desired Enterprise objectives	Examine ASPO interfaces pan-defence					• Recommendations regarding making ASPO effective as PPM tool for the submarine program
			Examine IMS as a PM tool					
		• To assess the balance between domain knowledge and process across the Enterprise		Examine alignment of overall UUC to maximise availability				• Recommendations as to suitable resourcing strategy to achieve sufficient levels of submarine knowledge
		• To make recommendations as to suitable process and organisational improvements that may be implemented.			Emerging Findings		Final Report Outbrief to team	

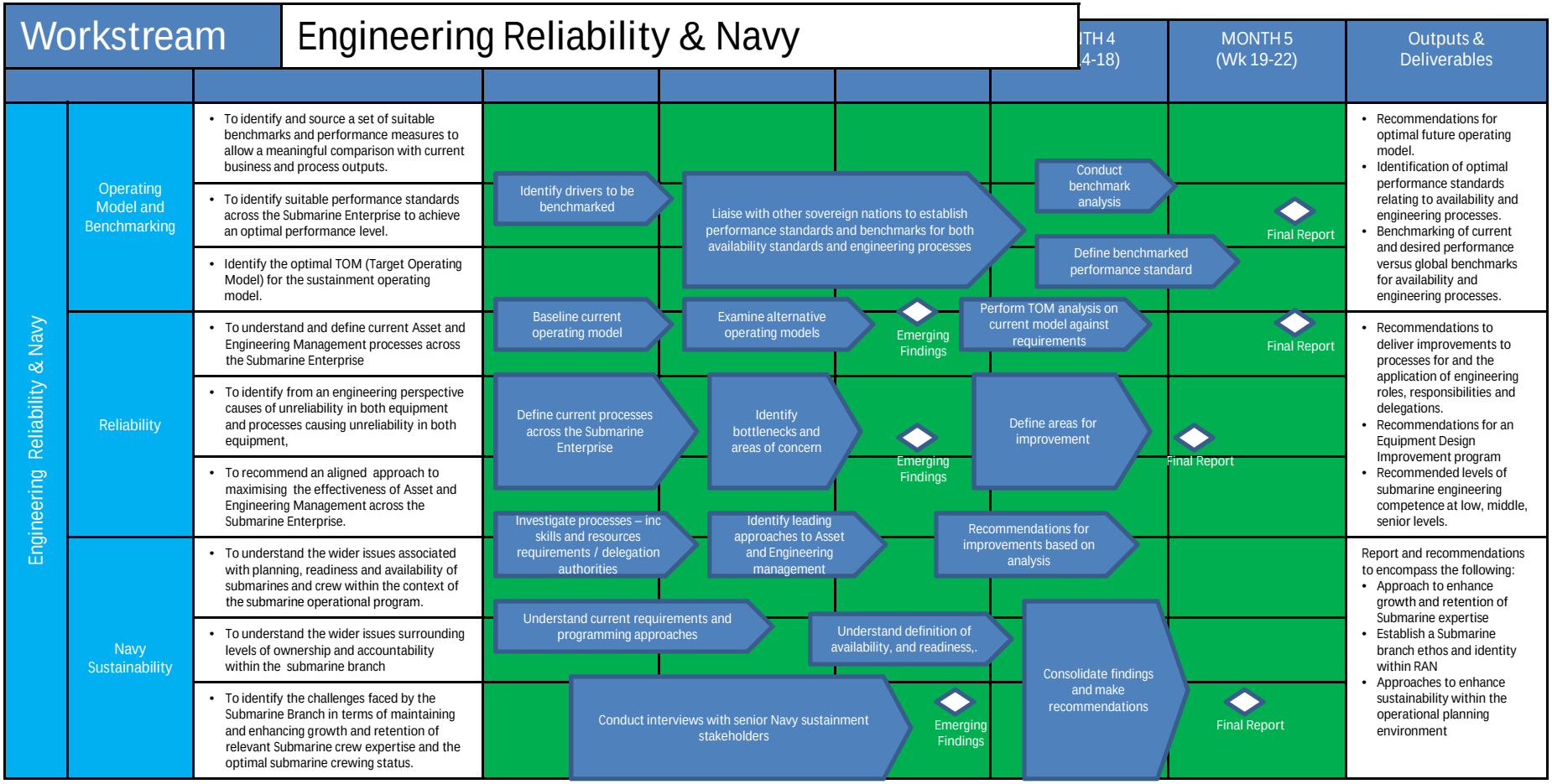
Role	Responsibilities	Man-days
Project Manager	Lead the Change Program and liaise with Senior Stakeholders	
Comms Manager	Manage communications strategy and stakeholder management on a day-to-day basis	
Senior Consultant	Support to Project Manager role in conducting analysis and developing outputs	
PMO Manager	To lead the Program Management workstream and the overall PMO for the task	
Engineering Expertise	To provide submarine sustainment advice to the Program Management workstream	
Gate Reviewer	To provide review management advice during to the Program Management workstream	
PMO Support	To provide support to the Program Management workstream and the overall PMO	

Workstream: Commercial

Workstream		Objectives	MONTH 1 (Wk 1-4)	MONTH 2 (Wk 5-9)	MONTH 3 (Wk 10-13)	MONTH 4 (Wk 14-18)	MONTH 5 (Wk 19-22)	Outputs & Deliverables
Commercial	Industry Analysis	• To develop and deliver an industry infrastructure, capability and capacity assessment to enable future optimisation of the wider industrial base (outside of ASC) to support sustainment of the Collins Class Submarine.	Identify current suppliers	Identify key and niche suppliers	Emerging Findings; Identify vulnerability in the supply chain	Final Report; Recommendations		Produce a comprehensive report focusing on : • Current supplier environment • Supply Chain Vulnerability • Constraints associated with the sovereign industrial capability and capacity • Key investment requirements • Potential benefits of additional investment • High level international and domestic market analysis • Recommendations and next steps
		• To identity potential areas of capital investment that may enable future optimisation or increases in capacity.	Identify current capabilities requiring investment	Identify potential new areas for future investment		Develop recommended investment plan		
		• Identify the key constraints and challenges facing the sovereign industrial base in meeting future requirements.	Define requirements	Examine effectiveness of E2E supply chain (high level)	Identify key risks, constraints and challenges			
		• Understand the competitive landscape, both nationally and internationally.	Assess capability and capacity of domestic industry; Assess capability and capacity of international industry					
	Contracts Analysis	• Review the nature and size of the current contractual landscape across the Submarine Enterprise.	Identify current contracts	Review contract break clauses / expiry	Assess appetite for alternative approaches	Identify refinements to ISSC		• Produce contracts map • Define potential opportunities in the current commercial structures for the refinement of the ISSC • Identify any potential refinements to structure of contract management organisation. • Recommend potential alternative approaches
		• To assess the effectiveness of current commercial mechanisms and approaches with industry to meet current and future requirements.	Analyse current commercial structures; Review current PPIM		Understand how structures drive supplier behaviour			
		• To make recommendations on the potential future alignment of commercial structures and the supply chain to achieve an optimised solution to achieve sustainment of the Submarine Enterprise on an enduring basis.			Emerging Findings	Final Report		

Role	Responsibilities	Man-days
Commercial Lead	To lead and integrate the Commercial workstream activities and outputs	
Industry Analysis Consultant	To perform the industry and market analysis activities	
Manufacturing Consultant	To undertake analysis of current industrial capability and recommend potential future manufacturing options	
Industry Analysis Support	To support the Industry Analysis workstream	
Contracts Analysis Consultant	Commercial expert to assess current commercial arrangements and recommend refinements / opportunities	
Contracts Analysis Support	To support the Lead and Consultants in the delivery of activities and outputs	

Workstream: Engineering Reliability & Navy



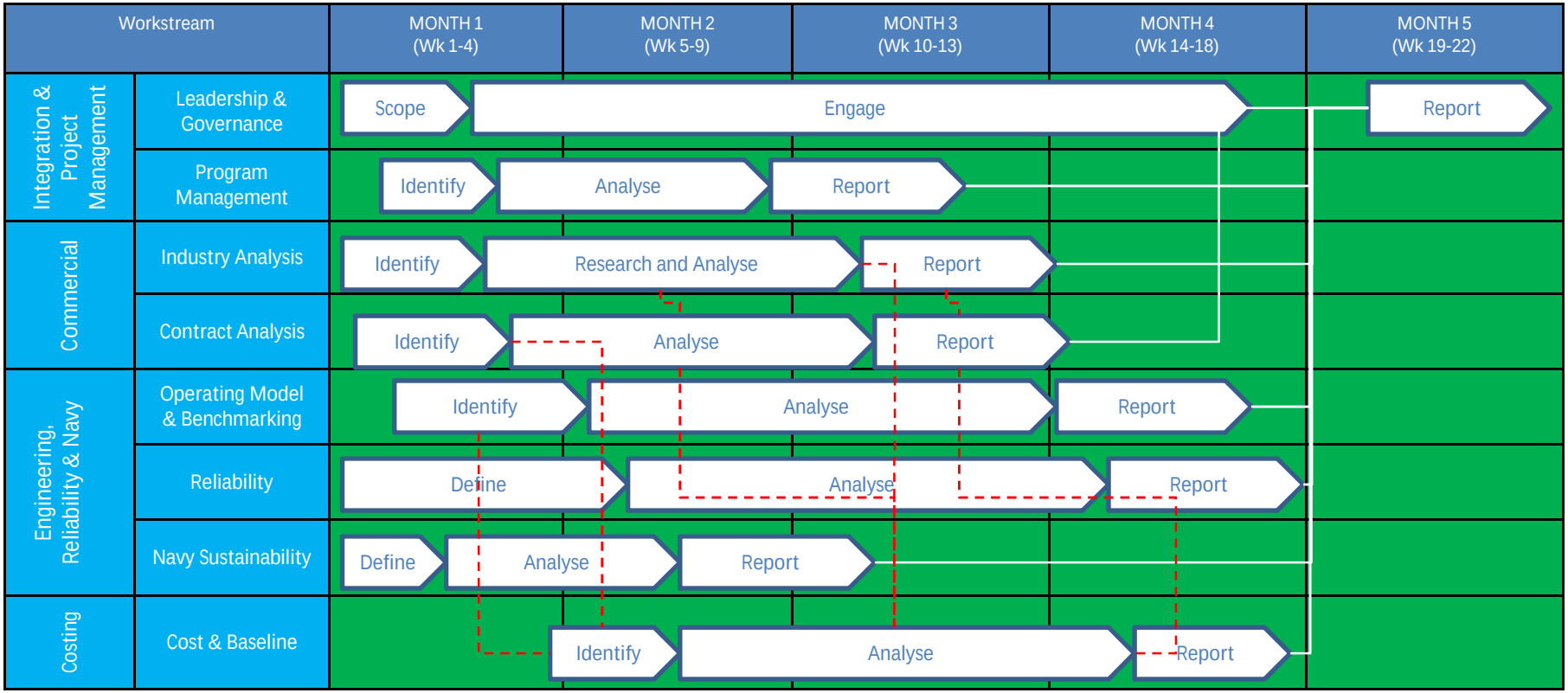
Role	Review existing reports and documentation	Man-days
Technical Lead	To lead and integrate the technical workstream activities and outputs	
Benchmarking & Performance Consultant	To lead the benchmarking and performance management activities	
Operating Model Consultant	To leads the investigation and development of the Target Operating Model	
Senior Engineering Consultant	To lead the Reliability workstream	
Engineering Consultant	To support the Senior Engineering Consultant in the delivery of the Reliability workstream	
Engineering Consultant (Naval)	To support the Senior Engineering Consultant in the delivery of the Reliability workstream	
Navy Sustainability Lead	To lead the Navy sustainability workstream	
Senior Submarine Officer	To support the Navy Sustainability Lead through the provision of Submarine expertise	
Senior Submarine Engineer	To support the Navy Sustainability Lead through the provision of submarine expertise	

Workstream	Costing

Workstream		Objectives	MONTH 1 (Wk 1-4)	MONTH 2 (Wk 5-9)	MONTH 3 (Wk 10-13)	MONTH 4 (Wk 14-18)	MONTH 5 (Wk 19-22)	Outputs & Deliverables
Costing	Cost and Baseline	• To baseline the current submarine enterprise, identifying funding sources and the transactional flow.	Construct high level cost map	Identify data sources	Collect data			• Production of current baseline cost map • Understanding of where costs are incurred
		• Produce the requirements to allow the construction and population of a robust Enterprise Cost Model (ECM)	Identify and define scope	Understand drivers and requirements	Define requirement specification for ECM Define parametric algorithms	Emerging Findings Gain agreement	Define implementation plan for ECM Final Report	• High level cost structure for ECM • Implementation plan for construction of ECM
		• Conduct analysis to allow identification and understanding (at a high level) of the drivers and activities impacting on balance of investment decisions, and to allow reasonable judgements to be made with regard to VfM and affordability of the program.			Sensitivity Analysis to understand impact of decisions on VfM	Emerging Findings Define potential investment strategies and options	Final Report	• Understanding of key drivers and sensitivities impacting investment decisions. • Identification of potential VfM enhancing scenarios

Role	Responsibilities	Man-days
Costing Lead	Lead the costing workstream	
Costing Support	Support the data capture, analysis and modelling within the costing workstream	
Costing Support	Support the data capture, analysis and modelling within the costing workstream	

Workstream Phasing and Interdependencies



Dependency

Annex G

Terminology and List of Acronyms

AWD	Air Warfare Destroyer
CCSM	Collins Class Submarines
Defence	Department of Defence
DoD	Department of Defence
DoFD	Department of Finance and Deregulation
DMO	Defence Materiel Organisation (part of DoD)
FAS	First Assistant Secretary
FCD	Full Cycle Dockings
GBE	Government Business Enterprise
Industry	A collective term, embracing all industrial elements contributing to the Collins Class capability
IMS	Integrated Master Schedule
ISSC	In-Service Support Contract
MRD	Material Ready Days
Navy	Royal Australian Navy
NIPO	Naval Inventory Procurement Office
Participants	The four organisations responsible for the CCSM (RAN, DMO, DoFD and ASC)
PMB	Pacific Marine Batteries
RAN	Royal Australian Navy
SA	South Australia
UUC	Usage and Upkeep Cycle
WA	Western Australia