REVIEW OF

DEFENCE MATERIEL OFFICE

MAJOR PROJECTS REPORT

2009-10

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EXECUTIVE SUMMARY

Analysis of the Defence Materiel Organisation (DMO) Major Projects Report (MPR) for 2009-10 indicates that nothing of substance has happened that will improve the performance of the organisation in acquiring and supporting Australia's military capabilities. As with previous reports, there has been only the addition of more process to an already process-bound organisation. The core problems have not been identified and no management initiatives have been taken.

The DMO continues to demonstrate a systemic inability to manage projects which are in any way 'complex', particularly those that include any degree of system development or integration It also demonstrates difficulties in providing in-service support on time.

These congenital problems stem directly from an entrenched, process-driven, contract-centric approach to project management, rather than employing sound Project, Systems and Equipment Engineering management systems and procedures developed especially for controlling technology projects. The situation that has persisted for more than a decade is an inevitable consequence of the 'not thought through' de-skilling and downsizing of the Services and the structural changes imposed by the Defence Reform Program (DRP) and Commercial Support Program (CSP).

The problems being encountered have been institutionalised firstly by the fundamental models used in the management and governance of the acquisition bureaucracy, and secondly by the practice of replacing technologically skilled engineering professionals with technologically unskilled generalists. That is, the imposition of administrative process over project and systems engineering management. For more than a decade, the approaches adopted have been shown not to work, and can not be made to work.

The slightly modified project status metrics now used continue to lack substance, and so will not provide the objective and auditable status of projects required by ANAO. Furthermore, Major Challenges, Measures of Effectiveness, Major Risks and Major Issues are, and will remain, outside the scope of Australian National Audit Office (ANAO) reviews. Hence, given the ANAO's qualification of the DMO's costing base and the role contingencies play, the status of DMO major projects is, for all practical purposes, not auditable, and as a result, the ANAO is unable to provide the assurance of good governance sought by government through the Senate Foreign Affairs, Defence and Trade Reference Committee in March of 2003.

The Defence Industry policies being pursued by Defence and the DMO, in the absence of any coherent and informed government policy, continue to undermine the skills, competencies and facilities bases in both the Services and Defence Industry, leaving Australia dangerously dependent upon overseas facilities for the engineering, maintenance and supply support of its military capabilities.

Finally, over the more than a decade that Defence and the DMO have faced major, but avoidable, capability acquisition problems, the higher governance mechanisms upon which Australia depends to identify and correct deficiencies in Departmental performance have been either unable or unwilling to pursue the rigorous governance disciplines required to reform Defence and its capability acquisition organisation. This analysis emphasises the need to start real reform of the Defence/DMO organisations before Australia's military capabilities deteriorate beyond repair.

ANALYSIS OF DMO MPR 2009-10

Background

This review builds upon an analysis of Defence Materiel Office (DMO) Major Projects Report (MPR) for 2008-09 (1), and it is most important that this review be read in conjunction with its predecessor as that analysis covered the changes that gave rise to the current Defence capability acquisition organisation, as well as many of the broader factors that have moulded the organisation over the years.

Complexity and Risk

Over the past decade, DMO has been increasingly generating the impression that its acquisition functions face extreme complexity and high risk, and that the problems that the organisation faces stem from those factors. The 2009-10 MPR dwells very heavily upon complexity and risk and their impacts upon DMO (Pages 83-87). Indeed, DMO had the Helsman Institute undertake a study in 2009 into the complexity faced by DMO in comparison with general industry. That report merely confirmed what every serviceman employed in new project or sustainment planning and management well knew before the DRP/CSP programmes disbanded the Services' well established and successful capability definition , acquisition and sustainment skills and competencies base, that had been developed over 70 or more years of experience. The Helsman Report has been mere window dressing, an attempt to excuse failures, and a total waste of money.

Part of DMO's solution to its problems with complexity and risk, which supposedly make it difficult for the organisation to maintain project schedule, is reflected in the recent Defence/DMO policy requiring the benchmarking of Military Off-The-Shelf (MOTS) and Commercial Off-The-Shelf (COTS) equipment "*against which a rigorous cost-effective analysis of the military effects and schedule aspects of all proposals (ie, military capability requirements) will be undertaken.*" Two important potential dangers stem from this decision:

- Firstly, the policy reverses the traditional onus upon MOTS/COTS equipment (in common with all other equipment offered) having to demonstrate that it meets specified operational and technical requirements. Under this benchmarking policy, the potential for mainly US-sourced MOTS/COTS equipment to be purchased by DMO over equipment that will better meet Australian - unique Service requirements is acute. In this sense, 'unique' means equipment that will perform, as specified in Australia's likely operating environments and suits Australian modus operandi, special military skills and capabilities. These factors are too easily dispensed with or denigrated where an apparently 'cheap and easy' procurement, seemingly without commercial risk, presents itself, and the imperative of 'interoperability' is invoked. DMO should have learned from its unsuccessful Army and Navy purchases to understand the factors involved and the nasty implications for those who have to use such equipment in battle, a well worthwhile lesson that appears not to have been learned. The path set by this policy will inevitably lead to Australia's Services, over time, becoming captive to being equipped to fight someone else's threats in someone else's threat environment and geography, using someone else's strategies and tactics.

- Secondly, it sends a clear message that DMO is incapable of managing successfully any projects that contain any measure of technical complexity, especially those having any hint of systems integration – a disturbing admission by an organisation that is charged with the national security responsibility for equipping and sustaining Australia's military services.

For over a decade, Defence and its acquisition organisations have struggled to meet their responsibilities, but with declining success, and the DMO now warns that it must continue to make generic mistakes before it can identify any need for systemic reform. The DMO was formed as, and remains, a simple purchasing organisation, centred upon complex contract /procurement 'business' structures and processes, an organisation that shows no understanding of the central role and importance of the project and engineering management systems that are needed to drive the contracting/procurement functions, not be a slave to them.

The management of technology reliant systems demands firstly staff with a sound technical knowledge of the equipment involved. Secondly, they must work as System and Equipment engineers within a robust Project Management organisation, otherwise the litany of generic 'lessons unlearned' by DMO will have to be repeated over and over, as is the case now.

How Technology Management Works

The management of technology based capabilities requires Project, Systems and Equipment Engineering skills and competencies to be applied rigorously from the Requirements Definition Phase, and throughout all subsequent phases of a project. Project Management Plans are needed to state how the project will be managed at the top level, while Systems and Engineering Management Plans are needed to drive all systems and engineering functions to meet the objectives of the Project Management Plan.

System Engineering Management Plans must have a range of Sub-plans to manage and integrate tightly all supporting project functions, such as Facility Plans, Manning and Training Plans, Maintenance Plans, Support Equipment Plans, Test and Acceptance Plans, Equipment Support Plans and so on. The objective of several of these sub-plans is to ensure that all lines and levels of support will be in place by the time that the system is delivered and accepted into service. With this approach, DMO's problems with integration and complexity and establishing capability support on time do not arise, and any risks to the project are able to be qualified and quantified and redressed promptly, at the lowest level, with least impact upon project objectives. In particular, there needs to be only one project completion date, not six as now introduced by DMO's new wave of processes.

Since its formation, the DMO has slavishly followed a commercial, contract/purchasing, process-driven, 'business' methodology, rather than technology-focussed, project and systems management systems that focus upon outcomes.

The inevitable consequences of not doing things properly in Defence acquisition are analysed at Annex A, which identifies the following major causes behind the problems and failures being encountered by Defence/DMO:

- The restructuring of Defence and the Services, coupled with the wholesale downsizing and de-skilling of the Services under the DRP and CSP, resulting in their inability to provide the skills and competencies needed for the proper management of military capabilities. This is especially evidenced by the inadequate statements of requirements that have driven projects, and the difficulties in managing design changes and other engineering challenges that have arisen throughout almost all projects.
- The abandonment by Defence and the DMO of project and engineering management systems over the period 1998 to 2001, and the introduction of commercial, process-driven administration to capability acquisition and sustainment, resulting in the risks and problems being seen with DMO projects today.

- The absence of effective governance at all levels - where Defence, Government and Parliament have been unable or unwilling to understand what is happening and to insist upon corrective action.

No amount of process can redress these problems.

Reporting Project Performance

In MPR 2008-09, DMO stated (page 55) that DMO's Project Maturity Score *"quantifies the maturity of a project by way of an objective score based on the Project Manager's judgement ...The score is then compared against an ideal benchmark score .."*. As pointed out at (1), DMO's MOE score is, by definition, not objective, but an unsupportable, subjective estimate open to a wide range of influences and competencies.

In the 2009-10 PR, DMO now states (at page 37): *"Key project performance information is important in monitoring whether the required capability is expected to be delivered on schedule and within budget. Such information has the potential to act as an alert to under-performance and a focus for management action."* The organisation then identifies four measures "*to provide a snapshot on project performance*", paired to generate two scores:

- The percentage of budgeted cost expended in relation to the percentage of the elapsed schedule time, (page 37 and Fig 2), and
- Project maturity progress as a percentage of the key capabilities expected by DMO to be delivered, (Page 39 and Fig 3).

The first measure assumes that these factors combine to provide a measure of progress in achieving the required capabilities, whereas no nexus exists between project expenditure and time elapsed on the one hand, and the extent to which required capabilities have been or will be achieved on the other. Having spent, say, 80% of budget and 80% of the scheduled time does not mean that 80% of the required capabilities have been achieved. Fig 2 is thus simply magical thinking and baseless.

The second measure is based upon DMO's assumption that assessment of the likelihood of any project delivering all its key capability requirements should "b*ecome better informed as a project maturity score increases"*. However, Page 39, and Fig 3, which purports to show progress in providing the capabilities required, lacks both substance and logic. It merely proposes that all the projects listed (with the exception of Wedgetail) will be delivered such that they will satisfy all their key capabilities. In addition, Fig 3 does not indicate when the optimistic forecast 100% of required capability will occur in relation to when the White paper and Project Schedule requires it. In short, it attempts to put the very best face on capability achievement, but ignores schedule delays.

Furthermore, DMO now cautions (para 2.5, page 38), that *"While the DMO's key capability measures should be interpreted with some caution due to their lack of rigour as a data system and the high level of uncertainty in forecasting outcomes overall, the DMO's assessment is that 20 of the 21 projects with key capability data in this year's MPR will deliver all their key capability requirements "*. Footnote 40 further warns that *"The DMO's assessment involved high levels of uncertainty which may cause actual outcomes to differ materially from that stated in the PDSSs"*.

It should be remembered that these measures drive not only project status reports to ANAO and the Joint Committee Public Accounts and Audit (JCPAA) , but also support the advice given and the proposals made to Government, especially at Gate Review Assurance Boards, which, as DMO states, "*depend upon an expert assessment of project development and status, and the*

prospects of a project achieving the agreed outcome".

The presentation of Project Maturity Scores and Measures Of Effectiveness as metrics of project status has now evolved into bar charts, percentages, and 'traffic signals', but the measures upon which these are based remain unchanged - they are simply subjective opinions lacking in any hard metrics, and do not give any real measure of project status.

The Problem With Numbers

Numbers are mostly meaningless if the objects to which they are attached cannot be measured with repeatable accuracy. It is important therefore to look closely at what is being measured and how. DMO makes use of numbers, and their cousins – such as bar charts, percentages and traffic lights of various types - to measure project and capability status, but in the main these measures are useless, and inherently misleading. They are based on what are called 'Potemkin Numbers' (2).

Potemkin Numbers are the mathematical equivalents of Potemkin Villages. They are merely numerical facades made to look like real data. Potemkin Numbers aren't meaningful because either they are borne out of a nonsensical measurement or they are not tied to a genuine measurement at all, springing forth fully formed from a fabricator's head. As Charles Siefe observed: *"Creators of Potemkin Numbers generally care little about whether their numbers are grounded in any sort of reality. From afar, however, they seem convincing"*. When used, they are often a powerful tool to prop up an argument and even the flimsiest can do tremendous damage. Fortunately, the power of Potemkin Numbers is limited as they evaporate as soon as they are made subject to examination.

Project Maturity Scores and their benchmarks and Measures of Effectiveness, with their wide ranging affects, thus need to be seen for what they are

The Enterprise Risk Management Framework (ERMF)

The management of risk within the DMO was analysed in detail at (1), but the steps now being taken (pages 86, 87) indicate that the organisation continues to ignore, or not understand, how risk must be managed in a technology intensive project. Risk is still seen only in contract management terms, and the DMO still expects risks to become visible and manageable following the retrospective (longitudinal) analysis of long-accumulated, generic 'lessons learned', which are now being allocated to another generic Category of Systemic Lessons. This is merely distracting attention from the core reason behind risk and its mismanagement within the DMO, while trying to give an impression of progress.

Until the DMO accepts that risk arises primarily from the technology (engineering) aspects of a project and must therefore be managed by skilled technologists employing project and engineering management methodologies, risk will continue to ravage all capability and sustainment projects. Unskilled generalists using 'high-end' risk management tools are doomed to failure.

Project Milestones (Pages 88, 89)

This MPR details the third significant change to project milestones introduced by the DMO, adding additional milestones to make a total of six. Essentially, these limit the DMO's function to providing equipment, not capability, which now rests with the Capability Manager. This arrangement will be implemented through the Capability Manager becoming a signatory to the Materiel Acquisition Agreement (MAA) and, inevitably, a range of amended and additional

paperwork and processes must follow. The new milestones are:

- Initial Materiel Release (IMR).
- Initial Operational Capability (IOC).
- Initial Operational Release (IOR).
- In-Service-Date (ISD).
- Final Materiel Release (FMR).
- Final Operational Capability (FOC).

This can be described only as process gone mad, and cannot be shown to contribute to improving project outcomes. This can be demonstrated by simply drawing an activity diagram for all of these processes so as to identify all organisational, functional, and financial interfaces.

Under pre – DRP/CSP service organisations, the RAAF, for example, had one operational milestone – the date when the system became not only operational but fully supported at all lines and levels in both the Service and Industry. The DMO's performance can hardly be said to be an improvement on that.

The Continued Growth of Process Over Outcomes

Reference A discussed the flight to process resulting from DMO MPR 2008-09, and identified an organisation focussed upon process rather than management changes that would lead to the outcomes required being achieved. MPR 2009-10 continues a flight to process that impacts almost every area of the DMO's activity, instead of an analysis of the organisation's management structure, policies, systems and procedures. Changes resulting from MRP 2009-10 include, examples only:

- Gate Review 'business improvements', which will distance DMO from Capability Development responsibilities, but the soundness of the guidance given government will still be based upon the unreliable metrics of Measures of Effectiveness.

- Risk management 'improvements' centred upon "*The identification of the lessons identified by internal and external audits undertaken in the DMO over the past five years",* aimed at understanding business level risks and their sources to become input to DMO's lessons learned methodology. This included the inputs in Ernst & Young's Internal Audit Report on the DMO's Enterprise Risk Management Framework (ERMF), which led to the development of a Chief Executive Officer Instruction on risk management, and the compilation of risk management controls for acquisition and sustainment activities. For the reasons given above, nothing should be expected from these changes except more administrative complexity and greater inertia.

- In regard to project lessons learned, amended guidance will be given on a range of Capability Definition documents, a Requirements Management System will be developed, as well as a Defence Materiel Instruction on requirements management, and a Requirements Management Guide, and a tailored requirements management training course has been developed.

- The introduction of additional capability delivery milestones to a new total of six, which will essentially restrict the DMO's activity to delivering procured equipment to the capability managers for their provision of the actual capability, distancing the DMO from direct accountability for providing required capabilities. This will simply introduce more organisational, functional, administrative and financial interfaces that will have to be

coordinated and administered.

- Contract changes that include a new Standing Order for Off-The-Shelf components, new AUSDEFCON Performance Based Support Contracting conditions, development of a new AUSDEFCON (Shortform Support) statement of work template, and industry improvements to reduce business costs.

- Schedule management changes that include improving project performance measuring and monitoring systems to mitigate project risks. As identified earlier, the DMO's methodology and measures have no sound basis, so nothing of substance should be expected from these changes. In addition, a Schedule Measurement Capability Model has been developed, termed Schedule Compliance Risk Assessment Method (SCRAM). Offered as a *"model of Schedule Management best practice"*, it is unlikely to achieve anything as the project/engineering/risk management systems and procedures appropriate to the management of military technology are not in place. It cannot function in the manner suggested within the DMO's current contract/procurement-centric organisation.

- Internal and external performance reports will be subjected to review and management reporting changes made.

This continuing flurry of changes to process are symptomatic of an organisation trying to plug a myriad of holes to keep the ship apart, but the crew seem to have lost sight of where they should be heading and how best to get there.

Project Lessons Learned (Page 87)

Detailed analysis of DMO's Lessons Learned and Project Longitudinal Analysis was included in (1). The Lessons Learned in the 2009-10 MPR continue to be generic in type, but are now grouped under a 'Category of Systemic Lessons', including:

- Schedule Management.
- Requirements Management.
- Contract Management.
- First of Type Equipment.
- Military Off-The-Shelf Equipment

However, the DMO warns that "*A new contract approach will have to be used on a number of projects before all lessons will have been learned.*", so the process is intended to be on-going. This is a strange methodology for any organisation to adopt, in that it only 'learns' retrospectively, through making mistakes, whereas standard project management methodologies are based upon prospective risk management, identifying risks and problems with a project as they arise or are forecast, and correcting them so that they do not impact the project adversely, or their effects are minimised on schedule, cost and capability. Retrospective analysis has a retrospective role to play, but it is of no use unless the project and engineering management systems appropriate to the equipment involved are in place and are managed by persons having a sound knowledge of the technologies involved, and managing risks as and when they arise or are forecast.

So, DMO remains committed to making mistakes so that generic 'lessons', ones that should not have been made in the first place, may be identified and then used to populate a data base from which they are segregated into a broad category aligned with selected management areas and sources of procurement. This is an expensive way of mismanaging projects.

DMO's approach is much like trying to drive a car by looking only through the rear vision mirror, with driving skills and competencies being dependent upon making mistakes.

Governance (Page 93)

Governance improvements identified by the DMO include Gate Review Assurance Boards the rely heavily upon the DMO's "*expert assessment of project development and status and the possibility of achieving the agreed outcome"*. However, DMO's expert assessments remain challenged by the weaknesses identified above in the project performance metrics adopted. More importantly, the reluctance or inability of our parliamentary governance mechanisms, despite clear warnings, to seek out and rectify the root cause(s) behind the problems that have persisted with capability acquisition and sustainment for well over a decade, is the real governance weakness.

Defence Industry Policy (Page 97-100)

This is the first time that an MPR has included the subject of Defence Industry. Australia's Defence Industry Policy has undergone many reviews, and statements come and go, leaving little, if any, evidence of their passing. Unfortunately, this is characteristic of all Defence and DMO reviews. Many of the problems we now have are a function of Government/Defence indecision and waffle and the DMO's 'supply and support' policy – seemingly adopted from the recently disgraced US Defense Acquisition's Total System Performance Responsibility (TSPR) approach. Applied by the DMO as a perceived project de-risking strategy, this has:

- Caused a flow of work from Australia's Services and Defence Industry to overseas (principally US) facilities, and
- Resulted in the closing of long-established and very efficient and effective weapon system and equipment support facilities that existed within the Services and Defence Industry.

In particular, the identification and establishment of strategically important industry capabilities was the subject of a recent Defence Industry Review, from which nothing resulted, except the further loss of critical Service and Industry capabilities. Defence Industry policy and practice have been a total and expensive failure for some two decades or more, and unless tackled seriously both Service and Defence Industry capabilities will largely disappear.

The disconnect between the DMO's policies and Defence Industry objectives is exemplified by the critical need for systems engineering expertise within the DMO to manage systems integration and other complex engineering tasks on the one hand, and the DMO's decision(for example) to close down the highly successful Boeing systems engineering and integration facility that had been built up over the years to support the F-111 Fleet on the other. This strange and short sighted decision seemed to be a matter of saving money at any cost in the short term.

Management within Government Departments, including Defence and the DMO, has been focussed upon outsourcing what are in fact core competencies, a policy and practice that carries considerable hazards, especially for Australia's military capabilities and national security, because of Defence/DMO inabilities to manage the risks involved. Outsourcing and its problems are analysed at Annex B.

Major Project Challenges (Page 105)

After a decade, these continue to be as vague and unqualified and unquantified as the Project Risks and the Project Lessons Learned. The DMO still focusses upon Schedule, whereas Schedule, Capability and Cost cannot be excised form one another – they must be managed together under

tight project management methodologies to ensure that the impacts of one upon the others are identified and managed properly while avoiding risk from all sources. To attempt to manage one in isolation is to court risk and generally failure.

Project Data Summary Sheets (PDSSs)

The PDSSs forming part of MPR 2009-10 have been analysed , with no significant variation in trends seen from the 2008-09 MPR. Comments on the 2009-10 PDSSs are included at Annex C, with Attachment 1 to Annex C providing a Risk Consequence Level for each project, based upon Australian and DMO risk management standards.

Summary

Analysis of the Defence Materiel Organisation (DMO) Major Projects Report (MPR) for 2009-10 indicates that nothing of substance has happened that will improve the performance of the organisation in acquiring and supporting Australia's military capabilities. As with previous reports, there has been only the addition of more process to an already process-bound organisation. The core problems have not been identified and no management initiatives have been taken.

The DMO continues to demonstrate a systemic inability to manage projects which are in any way 'complex', particularly those that include any degree of system development or integration It also demonstrates difficulties in providing in-service support on time.

These congenital problems stem directly from an entrenched, process-driven, contract-centric approach to project management, rather than employing sound Project, Systems and Equipment Engineering management systems and procedures developed especially for controlling technology projects. The situation that has persisted for more than a decade is an inevitable consequence of the 'not thought through' de-skilling and downsizing of the Services and the structural changes imposed by the Defence Reform Program (DRP) and Commercial Support Program (CSP).

The problems being encountered have been institutionalised firstly by the fundamental models used in the management and governance of the acquisition bureaucracy, and secondly by the practice of replacing technologically skilled engineering professionals with technologically unskilled generalists. That is, the imposition of administrative process over project and systems engineering management. For more than a decade, the approaches adopted have been shown not to work, and can not be made to work.

The slightly modified project status metrics now used continue to lack substance, and so will not provide the objective and auditable status of projects required by ANAO. Furthermore, Major Challenges, Measures of Effectiveness, Major Risks and Major Issues are, and will remain, outside the scope of Australian National Audit Office (ANAO) reviews. Hence, given the ANAO's qualification of the DMO's costing base and the role contingencies play, the status of DMO major projects is, for all practical purposes, not auditable, and as a result, the ANAO is unable to provide the assurance of good governance sought by government through the Senate Foreign Affairs, Defence and Trade Reference Committee in March of 2003.

The Defence Industry policies being pursued by Defence and the DMO, in the absence of any coherent and informed government policy, continue to undermine the skills, competencies and facilities bases in both the Services and Defence Industry, leaving Australia dangerously dependent upon overseas facilities for the engineering, maintenance and supply support of its military capabilities.

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ANNEX A: THE INEVITABLE CONSEQUENCES OF NOT DOING THINGS PROPERLY IN DEFENCE ACQUISITION.

ANNEX B: THE WIDESPREAD CONSEQUENCES OF OUTSOURCING.

ANNEX A

THE INEVITABLE CONSEQUENCES OF NOT DOING THINGS PROPERLY IN DEFENCE ACQUISITION

Many of the problems that have been encountered by Defence/DMO over more than a decade, without sign of substantial improvement, may be traced to government, in 1998 to 2001, directing its acquisition organisation to abandon the successful project and engineering management systems and procedures that had been built up by the Services over decades of experience, and to replace them with standard contract management processes common to government purchasing organisations. (R) The project and engineering management systems designed specifically to specify,evaluate, select, acquire, operate and sustain technology-based systems were then downgraded to become merely inputs to Contract/Procurement Managers and their administrative processes. The adverse impacts of this change in acquisition methodology are now evidenced in the Major Projects Reports being produced by DMO in response to Parliament's requirement for annual reports on major Defence projects.

The following table, drawn from DMO MPR 2009-10, highlights the consequences of not adhering to rigorous Project, Systems and Equipment Management Systems throughout the acquisition and sustainment phases of projects. The examples given are not exhaustive, but representative of the underlying causes behind projects failing to achieve their objectives in capability, schedule and cost.

Problems Encountered	Comments
Project: ***Air Warfare Destroyer Build:*** • Sub-contractor quality deficiencies. • Shortage of skills. • Configuration management problems. • Design changes. • Change Management procedures. • Shipyard capabilities and capacity. • System integration. • Project Office expertise. • Drawing management and delivery. • Tech assistance from US Navy. • Alliance Contract risks. • Contract escalation indexation. • Support data availability. • Unclear Certification requirements. • Certification data not available.	All of these problems should have been identified, scoped, and included in early project management planning. Several (such as configuration, design changes, and change management) are covered by standard engineering management systems. Others require project planning effort to identify project requirements and procedures, and negotiate how they will be managed, in consultation with interfacing organisations (eg, US Navy and contractors). Project planning should also have stated the maintenance policy to drive support activities, and through inspection verify the capabilities and quality at contractors. All of these problems were largely avoidable.
Project: ***AEW&C:*** • Project effort underestimated. • Project time underestimated. • Technical complexity underestimated. • Contract complexity underestimated. • Risk management underestimated. • Inadequate Contractor resourcing. • Inadequate support from 'stakeholders'. • Inadequate resources and time to provide in-service support	These problems also indicate an absence of proper, early project management planning and subsequent management. As a result, the problems encountered have resulted in capability, schedule and cost penalties that were quite avoidable.

Project: ***Muti-Role Helicopter:*** • Inability to meet capability requirements not understood. • Maturity of aircraft design not assessed or understood. • Limited intellectual property rights affected impacted capability development, value for money, availability of required data, and system integration. • Maintenance documents inadequate. • Inadequate in-service support. • Days due to manufacturing defects. • Capability targets delayed by design and reliability problems. • Certification delayed by immaturity of design. • Training impacted by lack of rate of flying effort available.	Each of these problems should have been identified, scoped and management approaches determined as part of early project management planning. In this way, many would have been avoided, while others would have been identified early and appropriate management procedures determined. Government and DMO entered into this project with eyes wide shut. The inevitable consequences have and will continue to haunt the Services so long as it is in service.
Project: ***Amphibious Deployment:*** • Wide impacts of regulatory requirements. • Requirements creep. • Combat and Communication Systems may not meet requirements. • Insufficient funds for logistics support, training and spares. • Unable to certify Air Space Management System. • Lack of clarity surrounding ship acceptance process. • Integration complexity underestimated.	Again, this project has suffered from a lack of early project management planning. Each problem reflects a failure to identify, scope and plan the activities that the project will have to manage before the project was submitted by DMO for Government decision. This project is fated to encounter more problems as it proceeds.
Project: ***Bushmaster***: • In the early planning phase of the project, the operational concept and functional performance were not clearly defined, making it difficult to understand and undertake appropriate cost-capability trade-offs. • Lack of Contractor ability to provide adequate cost estimates, and inability by Defence to evaluate the validity of the cost data. • Testing was not sufficiently planned.	These 'Lessons Learned' reflect wholly inadequate project planning and a high risk project to put before government.
Other Projects: Similar problems affecting other projects are identified in the Project Data Summary Sheet analysis at Annex A.	The problems reported with other projects generally follow those exampled above, varying only with the type and 'complexity' of the project.

Why Project/Systems/Engineering Management? - Very Briefly.

Requirements Definition.

Projects start with a stated capability requirement, normally initiated by Government, often via a Defence White Paper, or a Service to meet an already agreed capability, or to replace current equipment that needs upgrading or replacing. Planning to meet the requirement starts with an operational analysis which, must be done by the Service that will operate the equipment, reflect accurately the threat that will be faced over time, and be supported by a Technical Specification which covers the technology aspects of the requirement and how these will be managed to meet capability and sustainment requirements. These form the input to all subsequent Project Management Planning.

If these activities are not conducted thoroughly and coherently, then all subsequent activities will be laden with high capability, schedule and cost risks.

Project Definition.

This phase defines capability and sustainment requirements in sufficient detail so that potential suppliers and others involved are fully aware of what is required, when, and how the elements of the project will be managed. The core skills and competencies required for this phase are essentially Project, Systems and Equipment Engineers experienced in the technology being procured. If this stage has been completed to a verifiably high standard, the project may then go forward to government for approval to proceed. While some contract input will be needed, it is critical that contract imperatives do not drive the project - otherwise deficiencies and inadequacies will be embedded over the life of the project, as is the case now. Contract management should be focussed upon how best the project might be supported in accordance with project management planning.

It is critical that projects having significant levels of development or integration include Systems Engineering skills within the Project Management organisation, for it is not until systems engineering problems are managed and resolved that many other engineering and project activities can proceed.

If project management planning is inadequate, then all subsequent activities will carry high risk.

Source Evaluation and Selection.

The evaluation of contenders also relies upon Project, Systems and Equipment Engineering skills, with contract administration input. It is here that the ability of contenders to meet defined capability and technical requirements are identified, scoped and evaluated, and potential risk areas identified. Project Management must ensure at this stage that all project requirements are fully and accurately identified and scoped, are reasonable, and made clear to all contenders. If this is not done rigorously, then high risk will flow from the evaluation and selection phases into all subsequent acquisition phases.

At source selection, Project Management planning becomes far more detailed, and a Project Management Plan with its fully-integrated Sub-Plans (such as the Systems Engineering Plan, Manning and Training Plan, Facilities Plan, Ground Support and Test Equipment Plan, and so on) is developed . This Plan identifies and integrates all project activity so that all involved know what has to done, by whom, and when. When the Project Management Plan and its Sub-Plans are finalised and Project Milestones established, final contractual arrangements may proceed. At no

stage should the contract get ahead or drive the project, as this is a proven way for contract and contractor imperatives to complicate and conflict with Project Management Plans.

Acquisition Phase.

If the project management activities above have been conducted properly, the project will proceed as smoothly as possible and should not encounter the protracted problems identified in the DMO MPR Project Data Summary Sheets (PDSSs). Any problems that do arise will generally be identified early and rectified at the lowest level, in the minimum time and with least impact on the project.

Skills and Competencies.

This analysis, and statements made in the MPR PDSSs, indicate clearly that sound Project Management has been missing in DMO projects since 1998 - 2001, and the consequences of this have been widespread and unnecessarily expensive in capability, schedule and cost outcomes.

Traditionally, the skills and competencies needed for specifying and managing operational and technical requirements resided within the Services, where total responsibility for capability definition, acquisition, and sustainment resided. However, the Defence Reform Program (DRP) and the Commercial Support Program (CSP) resulted in the Services being de-skilled, downsized and relegated to undertaking only the lowest level of engineering and logistic support which required the lowest level of skills and competencies. In particular, the Services' engineering branches were disbanded, the effects being especially felt within the two high-technology Services - the Navy and the RAAF. The damage done was further compounded by the disbandment of the Services' Support Commands. Government and Defence planning was for these skills to be replaced by Defence Industry, but this did not occur, with Defence Industry now facing much the same problems as the Services, and would never have been able to provide the skills and competencies that reflect military requirements.

The result has been that the skills and competencies required within DMO are not available from the Services or industry, and cannot be developed within the DMO, as the skills and competencies required must have experience in the operation and technology of the capability being acquired, and DMO has no means of achieving this. In addition, the skills and competencies required to manage technology vary over the equipment life cycle, and DMO has no means of responding to such changing circumstances. Outsourcing any but the simplest of tasks carries high risk, as Defence/DMO do not have the technological skills and competencies required to manage outsourced tasks (Ref). Finally, both Government and DMO fail to recognise that technological skills and competencies are bred, not bought.

In addition, the fundamental models used by Government/DMO in the management and governance of the acquisition bureaucracy, and the premise that technologically skilled engineering professionals may be replaced with technologically unskilled generalists, and that process takes precedence over management, have been shown not to work, and indeed cannot be made to work.

Governance Problems.

This leaves parliament, government, and DMO with very uncomfortable decisions to be taken. Unfortunately, all three have been reluctant to even acknowledge that there is a problem, let alone that it goes to the very core of Australia's military capabilities and national security, is urgent, and needs to be rectified before even greater damage is done. This assessment is based upon a total lack of response to substantial analyses and representations made to DMO, Defence, and governance

agencies, especially the various inquiries and hearings conducted by Foreign Affairs Defence and Trade and the Joint Committee Public Accounts and Audit. Despite submitting substantial input to these governance bodies, nothing has eventuated. These may be accessed by reference to JCFADT and JCPAA websites.

ANNEX B

THE WIDESPREAD CONSEQUENCES OF OUTSOURCING

EXECUTIVE SUMMARY

Since the 1980s, Australia's industrial base has undergone major changes in organisation and management practices. Traditional hierarchical, functional structures were flattened, downsized and de-skilled as privatisation, rationalisation, deregulation and the need to reduce tariffs drove change in search of greater productivity and competitiveness. In technology-reliant enterprises, these changes were accompanied by a shift from long-term management of technology functions to short-term management of engineering disciplines primarily as cost centres.

However, while downsizing and de-skilling may show short-term cost savings, the practice is self-defeating in the longer term because sustained productivity growth requires the very opposite – that is, an expanding resource base of skills and competencies that keeps pace with developments in technology and increasing demand.

As part of these organisational and management changes, the outsourcing of perceived 'non-core' tasks soon became common practice. Today, outsourcing is pursued as a panacea for shrinking budgets and a path to increased productivity. In practice, outsourcing tasks, particularly in technology-dependent enterprises, directly increases management overheads which, if not provided for, results in the outsourced task being under-managed, leaving the enterprise open to high risk and cost. Over time, outsourcing only deepens the de-skilling embedded by downsizing. As technology advances, the contractor benefits from the technology and management experience gained and usually retains any intellectual property – the enterprise just keeps falling further behind, becoming progressively less competent to manage its outsourced tasks.

Redressing the now widespread problems must be undertaken seriously if Australia is to regain its reputation as a 'smart' nation with the skills and competencies base required to manage effectively both current and future challenges in a technology-intense, globalised environment.

Primary responsibility must rest with government to re-skill the public sector and redress the centralisation of power in ministerial offices, as well as set the policy framework and restructure and resource our education and training systems properly at all levels. Here, quality and substance must be the key drivers rather than simply lowering the bar to achieve increasing numbers of graduates at least cost. In particular, government needs to recognise that the customers of our training and education systems are primarily industry, commerce, business and government enterprises - those who provide and manage our wealth. All rely upon our education and training systems to deliver the products required – the skills and competencies needed to remain efficient and competitive globally, while advancing the scope and depth of the nation's intellectual capital.

The customer is not the student, and the education system is not simply a lowest-cost, service provider, as is the case now. This path has led only to a progressive lowering of standards, the devaluation of our training and education systems, and the erosion of our national reputation, leading to gross inadequacies in our national skills and competencies base.

Within government, the complexities seen within a public service overly focussed upon process rather than outcomes, and resistant to change, are not a bar to real and timely reform, given the management approaches proposed herein together with the use of management feed-back loops.

Enterprises, for their part, and particularly those that are technology-reliant, need to more skilfully identify their 'non-contractable' functions, and develop and maintain the technical skills and competencies base needed for their professional management. They must also ensure that these functions are given the management weight they deserve and take their proper role and place in the management structure.

Finally, basic management principles and practice need to be ingrained at all levels, as these form the foundation upon which all other competencies are built.

BACKGROUND

Since the Second World War, Australia, as well as many other Western nations, has seen major changes in its industrial base which have led in turn to major changes in management organisation and practices. To a large extent, these changes have been seen as a move from an industrial age that focussed upon manufacturing to a post-industrial age focussed upon the widespread use of technology to create modern, information-based, service industries. In concert with these changes, management organisation and practices shifted from a focus upon those technological disciplines relevant to the specification, evaluation, selection, production, operation, and support of technology to one tat focussed largely upon the administrative processes involved in simply providing a service. However, difficulties encountered over the past decade or more, in industry, government and defence, have highlighted major differences between the way in which technology needs to be managed, and the manner in which it is currently administered as a service. The adverse impact of outsourcing on the skills and competencies base in technology-based organisations is of particular concern.

Into the 1970s, management structures in technology-based organisations were typically hierarchical and forward-looking, usually providing for a planned internal succession that rested upon the corporate knowledge base – the wisdom, expertise and skills that had been built up over the years. However, this approach began to change during the 1980s, driven largely by deregulation, the need to reduce tariffs, and to improve Australia's productivity and competitiveness. The major change was to replace skilled, functional managers firstly with financial managers focussed upon short-term cost reduction, and then generalist managers from the business management schools who usually possessed no relevant functional knowledge. (1)(2)

The main tools used by 'new management' amounted to:

- Flattening of the organisational structure and downsizing to reduce direct labour costs, the brunt being felt by middle managers and the older members in the organisation, firstly 60 plus, then 55, and so on, breaking the chain of functional skills and competencies, and corporate wisdom and experience. The result was a sharp loss, indeed waste, of sorely-needed intellectual capital.
- De-skilling, by simplifying tasks to reduce labour and training costs.

During the rush towards the privatisation of government enterprises and the rationalisation of industry, two damaging policies were adopted, the impacts of which remain to this day:

- Firstly, there was the closing of in-house technical training facilities on the assumption that

training was not a 'core' function and that the marketplace would provide any skills and competencies needed, as and when needed, and at a lower cost. As a result, apprentice trade training and tertiary technology training schemes were abandoned.

- Secondly, there was the closure of in-house laboratories, research and development facilities, and test houses for the same reason and with the same reliance upon the marketplace to satisfy future needs.

These changes effectively broke the chain of technological management, expertise and experience upon which both government and industry had long relied. As a result, investment in Australia's future in an increasingly technology - dependent world largely ceased.

Since that time, successive governments and industries (now mostly now taken over by multi-nationals) have seen in-house technical training and development as simply a cost centre that provides no ready return on investment. Both have spoken loudly and often about Australia's skills crisis, but neither has been willing to face seriously the need to start reinvesting in the Nation's technological intellectual capital. Schemes come and go, at great cost, but to little, if any, effect.

Stephen S. Roach pointed to the dark side of such management changes (1):

> *"Instead of focussing on investment in innovation and human capital – the heavy lifting required to boost long-term productivity – corporate strategies have become more focussed on downsizing and compressing labor costs. The result is increasingly hollow companies that may be unable to maintain – let alone expand – market share in the rapidly growing global economy. If that's all there is to productivity recovery, the nation could well be on a path toward industrial extinction."*

That is, while downsizing and de-skilling may show short-term cost savings, it is self-defeating in the longer term as sustained productivity growth requires the very opposite – an expanding resource base of skills and competencies that keeps pace with developments in technology. Furthermore, productivity growth comes from accelerated technological innovation and a continuing improvement in the skills and competencies residing within the organisation's workforce, while downsizing and de-skilling act directly in conflict with this.

Against this background, both public and business enterprises have outsourced many of their functions. While outsourcing is not new, the range of functions being outsourced has grown considerably, and there is a growing trend to outsource to overseas countries. (3)

Today, experience is showing that outsourcing carries risks in the longer term for both the outsourcing enterprise as well as the national good, particularly where technology-reliant functions are involved. The widespread consequences of outsourcing and the broad measures required to correct them are analysed in this paper.

OUTSOURCING POLICY AND PRACTICE

Background

In industry and commerce, and in government and defence organisations, outsourcing is perceived as offering:

- A means of enabling organisations to divest themselves of 'non-core' functions so that they

may focus upon their 'core' competencies.

- A way of reducing costs, on the assumption that it is more economic to outsource a function than keep it within the organisation.
- A path to improving productivity, on the assumption that lower costs translate directly to a higher output per employee.

Today, under the continued pressures of ever-shrinking budgets, and the perception that outsourcing equals productivity, outsourcing is being expanded, pushing ever deeper into organisational functions, increasing the range of perceived 'non-core' functions to the point where outsourcing frequently carries unacceptably high risks. Wide experience, as reflected in the analysis that follows, indicates that the point has been reached where the question is not whether a function is 'core' or 'non-core', but rather whether it is really 'contractable' to an outside organisation.

The problems inherent in outsourcing, and the need for organisations to draw an 'outsourcing line', were analysed by Ronald Course as far back as 1930 (4).

Course argued that the characteristics of the transaction can make it difficult to outsource some tasks, and in such cases an organisation would be better off to do the task itself. Tasks that are difficult or costly to outsource demand additional management and should thus be done internally, as outsourcing them and then under-managing them may well be fatal. The need to manage properly the related strategic, quantitative and qualitative risk factors associated with outsourcing was reinforced by Raiborn, Butler and Massoud in 2009. (5)

The 'Course Line' will, understandably, depend upon the type and level of technology central to the success of the organisation, both now and into the future. While most high technology organisations may outsource some functions, they still need to manage all or most of the tightly-integrated phases in the life cycle of the systems they operate – such as functional and technical requirement definition, project management, continuing engineering and maintenance management relative to the technology involved in terms of technical specifications, source evaluation and selection, tender and contract management, test and acceptance, and life-of-type support. These requirements hold good for both hardware and software engineering management.

Outsourcing any or all of these integrated functions leaves the organisation with little or no visibility or control over such core functions as:

- Configuration Management (CM), the unbroken and documented control of which is central to ensuring that a system not only meets its functional requirements and specified engineering and maintenance standards but does so safely, and can be evolved in a controlled and timely way to meet changing circumstances and future requirements. A lack of understanding of the role and importance of this function is seen commonly in both hardware and software management today.

- Maintenance Management (MM), which monitors system and equipment performance so as to identify those defect and failure trends that require engineering or maintenance intervention. MM drives the maintenance policies and procedures that ensure system performance and reliability are maintained at the required level, economically.

- Safety Management (SM), which must be integrated into the technical management function, as CM and MM provide for the timely identification of hazardous conditions and determine the appropriate, pre-emptive action(s) required to avoid or minimise hazards. Today, safety management is too often applied as a band aid to patch disjointed or broken

engineering management systems.

Tightly-integrated sub-systems and procedures underlie each of these core functions so that the operational and engineering status of a system is monitored and measured on a continuing basis, enabling risks to be identified and managed before they mature. This reinforces the old engineering precept that it is far cheaper and safer to stay out of trouble than it is to get out of trouble.

Outsourcing any of these core functions breaks the functional and technical management chain, leads to loss of visibility and control, and increases functional and technical risk (3). In such cases, effective management of outsourcing will often demand as much, or more, management effort and cost as retaining it in house – that is, the 'Course Line' has been exceeded. In effect, outsourcing high technology tasks, on the grounds of lower cost or increased productivity, only increases the management overheads of the organisation, and if this overhead is not acknowledged and provided for, then the outsourced function will be under-managed, resulting in high risk and cost, and a further deterioration of in-house skills and competencies.

Over time, outsourcing only deepens the de-skilling problems resulting from downsizing. As technology advances, the contractor benefits from the experience gained and usually retains any intellectual property – the organisation's knowledge base will thus fall further and further behind. In the end, the contractor to whom the function has been outsourced will frequently drive the enterprise through its outsourced requirements.

While outsourcing in-country may well result in de-skilling and further downsizing the workforce of an organisation, the skills so lost at least remain in-country as a part of the pool of national skills and competencies. However, outsourcing offshore carries the added penalty of eroding our national skills and competencies base, and may also lead to the loss of productive infrastructure.

Outsourcing Information Technology Support

When the Federal Government announced its plans to outsource Whole of Government IT (Information Technology), The Australian Computer Society (ACS) urged caution, pointing out that *"Whole of government IT outsourcing is a high risk approach for individuals, organisations and for the community as a whole. It is important that all those involved understand their obligations and the risks, as well as the potential benefits"* (6). This warning was based on ACS's perception that use of on-line technology was drifting due to a lack of direction by our politicians, media, bureaucrats and company executives, with Australian technologists hampered by a lack of vision from our technically illiterate leaders (7).

ACS subsequently issued a briefing paper which highlighted:

"One potential disadvantageous trade off is the existence of hidden or additional costs. One of the hidden costs in an outsourcing contract can be the erosion of staff skills. Contracts generally provide for IT staff to move to the outsourcing company, with a guaranteed period of employment. This provides a pool of staff with knowledge of the client's business and local conditions. However, over time, there may be cost pressures to use less trained and overseas staff, with a resulting lower quality of service" (8). The customer, of course, having lost his organic expertise, will generally be unable to recover the situation effectively or timely.

In the US, experience with outsourcing IT shows that jobs were lost and the chain of experience that is important to technological innovation was broken and, with extensive outsourcing

over time, companies lose the ability to use and develop IT innovatively. As a result, some researchers are questioning the value of broad-based outsourcing, noting that in the US banking sector the top performers were those who outsourced least. Susan Cramm also highlights the fact that leaders are built, not bought, and that building leaders requires a pipeline and a process. (9) (10).

In many organisations, the IT function is critical to its existence, and is thus clearly a 'core' function that cannot be outsourced without attracting unacceptable risk. In such cases, the function should be classified and managed as 'non-contractable', and the organisation skilled accordingly.

Furthermore, many organisations seem to feel that by outsourcing an IT task, they also outsource accountability for that task. In fact, accountability cannot be outsourced, much in the same way that management tasks may be delegated down the line, but accountability for that task remains with the responsible functional head.

The recent Virgin Blue airline booking system 'meltdown' is a good example. Some $15 to $20 million has been reported to have been wiped from the company's pre-tax profits by the protracted failure of its outsourced computer-based booking system, although compensation may reduce this figure. Throughout the whole problem, and into the future, it will be Virgin Blue, not its IT provider, that has had to suffer the very public frustration and anger of its customers and heavy loss of revenue. In short, while tasks may be outsourced, an organisation can not outsource its primary accountability for managing that task professionally. This incident will always be known as the 'Virgin Blue Booking System Meltdown', but it is doubtful whether the root cause will be identified and appropriate organic IT management roles and competencies introduced – legal factors and brand image will predominate. The more recent National Australia Bank IT breakdown further highlighted the widespread, consequences of integrated IT system failures.

The BP disaster in the Gulf of Mexico also carries many lessons for companies that are technology-dependent. No matter where the 'blame' is found finally to rest, it will always be known as 'The BP Disaster'. In this case, repeated engineering warnings of unacceptable risk were reported to have been ignored by higher management, which gives rise to the question as to whether engineering management (and BP is essentially an engineering-based organisation) carries adequate weight throughout the organisation, particularly as a check and balance where engineering problems are seen to conflict with corporate cost and schedule pressures.

In 2007, following its Texas City refinery fire, the company vowed to focus 'laser-like on safety', but a month before the Gulf disaster the Occupational Health and Safety Organisation found 62 safety violations at its Ohio refinery. Now, following the Gulf disaster, the Company intends to create a safety unit that will have sweeping powers to challenge management decisions that are considered to be too risky. However, this will be to little avail if the core engineering functions within the company do not have the required skills and competencies base, together with the necessary weight and standing within the corporate organisation to balance cost and schedule pressures, for safety is fundamentally a core engineering function, not one that can be replaced by an external band aid. Safety is part of engineering!

The potential for IT outsourcing to progressively de-skill organisations was discussed in an Editorial published in an Australian IT industry journal, the *Open Systems Review* in 1995. This noted that while corporate management may feel that its outsourcing decision has been a good one, it has really led to an inevitable erosion of its critical technical skills and competencies base, thus opening the corporation to increasing risk over time. The Editorial also highlighted the effects of outsourcing upon the capability of corporations to take informed technical decisions, particularly when purchasing equipment or planning computer infrastructure, noting that bad technical decisions

blow deadlines, increase cost, reduce productivity and damage corporate reputation.

However, the pervasive and growing use of IT and the rapid advances seen in IT application and technology make it a function that will have to be managed even more closely than is the case now if companies are to avoid the risks associated with outsourcing core functions over which they will have no visibility or control(11). Such companies will need to re-skill in IT management competencies if they are to avoid the ever-spreading risk of IT failures on core corporate functions.

Government Outsourcing

Some 45 years ago, the Vernon Inquiry into Australia's economic performance (12) lamented the poor quality of the assessment of investments in the public sector, and the resulting waste of scarce capital. The Treasury's solution was to require that public investment decisions be assessed carefully "*against proper economic criteria [including] the economic return that would have been obtained had the resources been put to their most productive alternative use*". The resulting tradition of rigorous cost-benefit analysis saved many billions of dollars over the years that followed.

However, today, as evidenced by the series of damning reports coming from the Australian National Audit Office (ANAO) (13), the benefits stemming from the Vernon initiatives have evaporated. Governments, both State and Federal, now view rational economic assessment of their programs as a nuisance that prevents then from taking their highly announceable and populist policy investment decisions as and when they feel that they will gain maximum political effect. Furthermore, both State and Federal tiers of government have amended their guidelines on Regulation Impact Statements (essentially cost-benefit analysis) so as to avoid public scrutiny (12).

The resulting poor public decisions and lack of transparency have become toxic to both good government and good governance. Failed and deficient programs over recent years have given rise to a public perception that 'Nothing has been thought through', which is symptomatic of either a lack of the skills and competencies required to provide sound public policy advice and provide sound policy implementation in support of government policy, or ill-advised political interference and unrealistic time frames – or both.

While deregulation and productivity have been given lip service at times, there has been little, if any, policy development or action to improve Australia's current and future productivity, and greater deregulation has only resulted in more regulation. Former competition head , Alan Fels, in speaking to *The Weekend Australian*, argued that spending is one thing, but the growth in regulation is a more salient feature these days in most capitalist countries. *"Contrary to the myth of deregulation, the amount of regulation has been rising and will continue to do so. It is a paradox. As governments privatise and try to deregulate, more regulation is required"*. Within this environment, both State and Federal Public Service employment growth over the past decade or so has grown strongly. The Federal growth is shown at Fig 1.

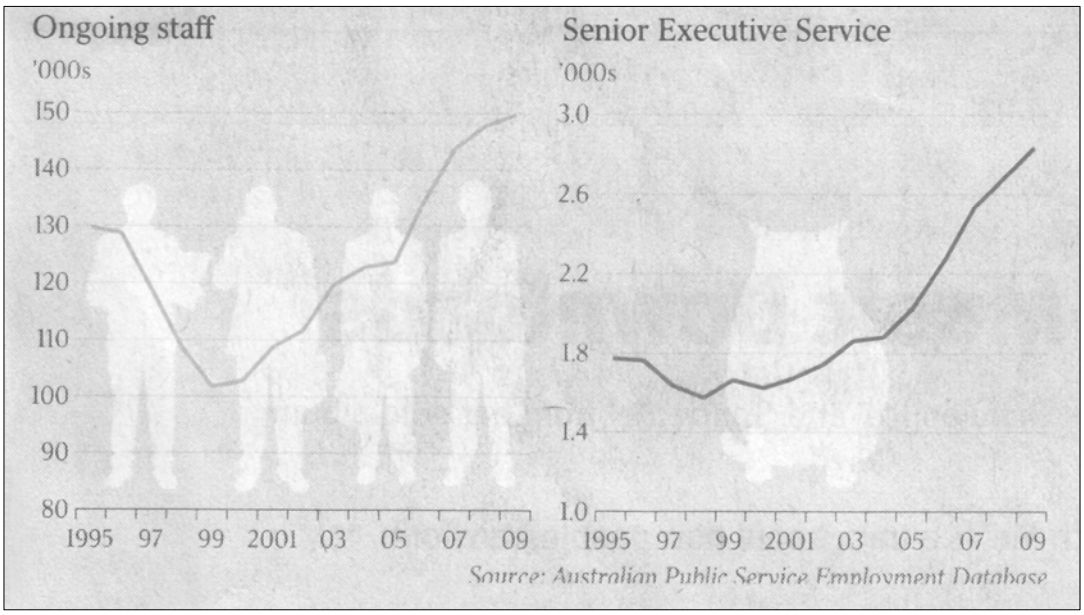

Fig 1 Public Service Growth

Since 1998, the Senior Executive Service (SES) grew by 81% compared with 38% for the entire public service. However, while some 40% of federal ongoing staff are located in Canberra, some 75% of SES staff are based in the Capital, essentially in ministerial offices (14). Despite this marked growth in senior executive staff, the Federal Government, has turned to management consultants, academics, market researchers, think-tanks, and the help of media advisers, to fill perceived gaps in policy development advice that the bureaucracy has been unable to satisfy. Bureaucracies have also outsourced many of their own core tasks, some to the point where they have, at the executive level, now become unproductive overheads. This complex, dysfunctional and expensive structure is symptomatic of:

- A lack of accountability of departmental secretaries for the functional performance of their departments.
- A lack of required skills and competencies in the specialist functional areas for which departments are responsible to provide policy guidance and to manage policy implementation.
- A lack of basic management competencies in task planning, organisation, direction, and control at all levels. In the absence of sound management, producing such things as codes of conduct and manuals on ethics becomes only a waste of time, effort and money.

This has led to a growth in administrative process in an effort to fill the vacuum in specialist departmental skills and competencies, and the imposition of administrative process under compliant 'managers' (replacing management by experts), at functional organisations, such as schools and universities, hospitals, and infrastructure projects, to name only a few.

As a result, departments are incapable of undertaking their delegated responsibilities competently, in a timely fashion, or economically, and are unable to manage outsourced tasks competently. While governance mechanisms have frequently identified these problems, meaningful corrective action has been avoided by successive governments.

Accountability for the debacles that have occurred has also been largely avoided. While the Minister carries primary responsibility for his department, it is the Secretary who carries responsibility for the proper administration and competent management of the functions performed

within his department. However, secretaries, who are now seen as equivalent to Chief Executive Officers in industry, are invisible and seem unburdened by any accountability as would happen in industry.

Finally, in contrast with the organisational flattening, downsizing and deskilling that took place within industry, there has been strong growth in the Federal Public Service, particularly in the SES Bands, which should have led to an improvement in the management of government business, including the identification and management of tasks that should and should not be outsourced. However, there has been no improvement, as the lengthening list of failed projects attests.

If improved government competence is to be achieved, as it must, government departments and those who staff them will need to regain and develop those specialist skills required for the proper discharge of their responsibilities. In the main, these will relate to technology and basic task management competencies. The critical need to re-skill the Public Sector, and redress the centralisation of power within ministers' offices, should rank as two of the most important areas for study and action by those in government responsible for ensuring good governance. Finally, functional organisations must be freed to manage their affairs in a professional manner as they are far better able to determine the resources needed and how they should be spent.

Reform of the Public Service

In September 2009, the Prime Minister established an Advisory Group to review Australian Government administration and to develop a blueprint for reform. The report and blueprint were delivered in March 2010 (15).

While the report raised the question as to "*How is the APS performing?"*, it failed to look seriously at, let alone answer, the question, and simply went on to say that a world-class public service must:

- meet the needs of citizens,
- provide strong leadership and strategic direction,
- possess a highly capable workforce, and
- operate efficiently and at a consistently high standard.

In the absence of any qualification or quantification of perceived problems and their solutions, the report claims "*That the blueprint recommends nine signature reforms grouped under the core components of high performance"* in order to achieve "*A high performing public service"*. The nine signature reforms, not surprisingly, all lack substance.

The Forward to the report finishes with: *"More broadly, the Blueprint puts people at the centre of public service reform. Ultimately, it is people, not systems, who produce excellence and drive change"*. The report thus follows in the tradition of previous such reports, controlled by an APS comprising people who simply follow administrative process, rather than an organisation striving to achieve outcomes – an organisation following a systems approach which calls for the disciplined and auditable application of appropriate skills and competencies, in accordance with appropriate and sound management policies, systems and procedures, to achieve a planned outcome.

In summary, the report and its blueprint fail as an incisive management analysis of the need for improved APS performance and how real change might be made. In implementation, its proposals will be costly and time consuming, and will most likely result only in a call for more staff to handle the additional reviews and complex processes introduced, leaving the underlying causes

untouched.

Subsequent to the report, Terry Moran, Secretary of the Department of Prime Minister and Cabinet, in his speech to the Institute of Public Administration on 8th December 2010, stated that, while the Federal Public Service is there to serve the PM and Cabinet, its higher goal was serving the nation's citizens, putting their needs, individually and collectively, at the centre of its work. While acknowledging that the public service is obsessed with administrative process at the expense of outcomes, he wants public servants "*to explore new ideas to find new ways of delivering services and tackling problems...to encourage new ways of asking questions*", and to seek agility, vision and a sense of vocation. This seems to be a poor result from the seven First Assistant Secretaries forming the in-house management consultancy established in Mr Moran's Department.

The steps outlined by the Secretary to improve public service efficiency amounted to:

- The use of Delivery Boards to improve oversight of high-risk programs, an approach that will increase process and not provide the specialist management skills and competencies needed, as evidenced by Defence/DMO experience with such boards.
- A (long-overdue) review of the size and role of the SES to improve management.
- Efforts by the Department of Finance and Administration to cut red tape, review efficiency measures and improve governance.

Unfortunately, all avoid the three keys to a better performing public service:

- The current deep penetration of politics into what should be a politics-free implementation of policy by the public sector, together with stronger governance to ensure that departmental advice given the Minister is verified and correct.
- The re-skilling of the public service, so that they understand what they are managing and possess the systems and procedures and the skills and competencies required to manage outcomes (public services) effectively. (That is, replacing process-centric administration with outcomes-based management)
- The critical need for management feed-back loops to ensure visibility and control of program activity and status, and to facilitate governance oversight.

Feed-back loops, integrated with, but independent of, functional management, are designed to provide current and accurate project status visibility up through the executive chains of management and governance. Such loops, properly resourced in skills and competencies, offer a more cost effective and time efficient means of introducing reforms that become self-actualising and so will not fade over time or through interference or neglect. Such loops may be expected to be formed and functioning within about twelve months and be achieving self-actualising behaviour within two years.

Using this approach, the complexities seen within a public service overly focussed upon process rather than managing outcomes are not a bar to real and timely reform.

Outsourcing Defence Capabilities

The rush to flattened organisations, de-skilling and outsourcing also swept through Australia's defence organisations. Traditionally, the Services possessed and developed the core operational, management, and engineering skills and competencies base required for mounting, sustaining and supporting operations, as well as those for specifying, evaluating, selecting, procuring, introducing and supporting new capabilities. The over-arching policies, systems and procedures employed had been built up over decades of hard-won experience.

However, this competent and widely-respected organisation was swept aside by the structural changes that started with the Tange Review of 1974, followed by by the Commercial Support Program (CSP) (1991-97) and the Defence Reform Program (DRP) from 1997. These led, for example in the RAAF, the highest technology Service, to:

- A flattened and downsized Service Office organisation, with its core skills and competencies base, especially in the Technical Services discipline, disbanded and outsourced.
- The introduction of a General Officer List against which higher-ranking officers are promoted, effectively cutting off the Service's skills and competencies stream, resulting in generalists being employed in critical, higher-level, Service and Defence/Defence Materiel Organisation (DMO) posts that demand critical specialist operational, project management and technological skills and competencies.
- The imposition of the Commercial Support Program (CSP), combined with the loss of the Service's Support Command, which reduced dramatically the Service's skills and competencies base to that of a simple operator of equipment.

The structure evolved by Defence to replace the lost core Service functions in capability definition , acquisition, and sustainment has become the Defence Materiel Office (DMO), a wholly centralised organisation characterised by a contract-centric, quasi- business-like management approach that sees operational analysis, project management, and engineering skills and competencies as contract-supporting services, not contract drivers. From its earliest days, DMO has failed to understood risk management, which has led to its acceptance of exceptionally large risks and its adoption of two ingrained outsourcing practices:

- A strong preference to use major overseas contractors, usually the equipment manufacturer, rather than smaller local companies, on the grounds of lower perceived risk, higher perceived reliability and being considered better able to respond to problems.
- The use of supply plus life cycle support contracts in an attempt to outsource risk by transferring it to the contractor. These contracts now include core engineering, maintenance and supply management functions, so that Australia simply becomes an equipment operator, wholly-dependent upon overseas-based contractors reporting to overseas-based management boards.

Despite being advised repeatedly that capability definition, acquisition and sustainment must be driven by by a tightly-integrated flow of operations analysis, robust project management, and strong engineering expertise in the technology being acquired, and that current outsourcing practices carry long-term cost and national security risks, nothing has changed for the better. Defence/DMO's response to perceived problems has been to add additional layers of process and raise the level of bureaucratic overview. The problems that DMO has encountered with the management of its major projects were highlighted in the critical ANAO report into DMO Major Projects for 2008-09, which was analysed in detail in the report cited at (16).

It is thus not surprising, that after a decade or more, DMO Major Projects are still being characterised by such basic problems as those listed in the recent ANAO Lightweight Torpedo Replacement Project Report (17):

- Initial costing of Phase 2 of the JP 2070 was not sufficiently rigorous or subject to adequate scrutiny.
- Project planning and management was inadequate, and in some instances key documents were either not developed, or were not developed on a timely basis.
- The decision to use alliance contracting arrangements ...was not based on structured analysis of contractual options, and once implemented was not adequately supported.

- An inadequate understanding of the weapon and its development status...contributed to an underestimation of project risk.
- The risk involved in integrating the weapon into multiple platforms was acknowledged, but not fully appreciated at the outset. The cost to integrate was underestimated significantly.
- The planning of testing and acceptance, and the resolution of testing and acceptance issues ...has been inadequate.

Assessed against the key purpose of a major capital acquisition, the ANAO report judged that the project has not been managed effectively as it will not deliver the capability originally sought by the ADF and, although the project remains within budget, this has been achieved by removing three of the five platforms to which the torpedo was to be fitted.

Each of these difficulties is symptomatic of:

- A lack of the core skills and competencies required for the successful management of high technology projects, together with
- the continued use of contract-centric ('quasi-business-like') processes as the primary project management vehicle rather than established and proven project and engineering management systems and procedures.

DMO is thus a good case study of the failure of 'new age' flattened, downsized, and de-skilled organisations, that rely upon the outsourcing of functions that are inherently not 'contractable'. In the face of continued failures and deficiencies in the management of capability requirements, "*The Defence Capability Handbook 2010, which was released in interim form in March 2010, indicates that* ***military or commercial off-the-shelf options should be used as a benchmark*** *for considering acquisition options. The handbook indicates that any option that moves beyond the requirements of an off-the-shelf solution must include a rigorous cost-benefit analysis of the additional capability sought so that the full resource risks and other impacts are understood"* (18).

In short, Defence/DMO are abandoning their core responsibility for ensuring that Australia's military capability requirements are identified properly and satisfied in light of Australia's unique needs and operating environment. Mandating off-the-shelf solutions merely takes pressure off Defence/DMO on the pretext of saving time and money, but it carries a real danger that Australia's military will become further de-valued in core skills and competencies, and equipped to fight someone else's threat systems in someone else's threat environment and geography.

THE WAY FORWARD

Redressing the widespread problems stemming from outsourcing will require positive action to be taken in several areas of both business and government management. The task will be neither simple nor easy, but action must be taken if Australia is to regain its reputation as a 'smart' nation, one able to manage effectively both current and evolving challenges in a technology-intensive environment.

Primary responsibility must rest with government to re-skill the Public Sector and redress the centralisation of power in ministerial offices, as well as set the policy framework, restructure, and resource our education and training systems at all levels. Quality and substance must be the key drivers rather than lowering the bar to produce increasing numbers of graduates at lowest cost. In particular, government needs to recognise that the customers of our education systems are primarily industry, commerce, business and government enterprises - those who create

and manage our wealth. All rely upon our education system to deliver the products they require – the skills and competencies needed to remain efficient and competitive over time, while advancing our national intellectual capital.

Some established concepts and practices will need to change. The customer is not the student, and the education system is not simply a lowest-cost, 'service provider', as is the case now. This path has lead only to progressive lowering of standards and the devaluation of our whole education system and national reputation, resulting in gross inadequacies in the national skills and competencies base (19) (20).

Enterprises, for their part, and particularly those that are technology-reliant, need to better identify their 'core' and 'non-contractable' functions, and develop and maintain the technical skills and competencies base needed for their professional management. They must also ensure that these functions are given the importance they deserve and take their proper role and place in the management structure.

Finally, sound management principles and practice need to be ingrained at all levels, as these are the foundations upon which all other competencies are built.

CONCLUSIONS

Since the 1980s, Australia's industrial base has undergone major structural and management changes. Functional structures were flattened, downsized and de-skilled in the search for increased productivity and competitiveness. In technology-reliant enterprises, these changes resulted in a shift in focus from the long-term management of the technology upon which the enterprise depended to a short-term focus upon reducing costs in all functional areas, with engineering disciplines being viewed merely as separate cost centres, and their functions as service providers able to be outsourced.

As part of these changes, outsourcing perceived 'non-core' functions has become increasingly common. However, outsourcing tasks, particularly in technology-reliant enterprises, directly increases management overheads which, if not recognised and provided for, will result in the outsourced task being under-managed, leaving the enterprise open to high risk and cost. Over time, outsourcing only deepens the de-skilling embedded by downsizing. Outsourcing overseas carries the added penalty of eroding our national skills and competencies base and often leads to the loss of productive infrastructure.

The outsourcing of IT functions carries the potential to progressively de-skill IT-dependent organisations so that they soon become unable to take informed technical decisions when specifying their IT requirements, select and purchase equipment, or plan their computer infrastructure. The result has often been bad technical decisions, blown deadlines, increased cost, reduced productivity and damaged corporate image. With rapid advances in IT technologies and applications, current problems will only escalate. IT-dependent organisations must thus re-invest in organic IT skills and competencies if they are to survive.

Experience with government outsourcing reveals similar problems, but within a far more complex management environment than private organisations. The general problem that has developed in the public sector has been the concentration of non-skilled executives in ministerial offices, particularly at the federal level, together with the politicisation, fragmentation, and blurring of accountability throughout the administration – upsetting the important balance that once existed

between politics and what should be a politics-free administration that implements government policies and programmes effectively, efficiently, timely, and economically. Within this environment, the proper management of projects, including outsourcing, has become almost impossible. Government is also the main provider, through our training and eduction systems, of the skills and competencies base that Australia needs if it is to remain competitive in a rapidly changing world – an area where sweeping improvements are sorely needed.

Within government, the complexities seen with a public service overly-focussed upon administrative process rather than the management of outcomes, and being resistant to change, are not a bar to real and timely reform if the approaches to management outlined are adopted and feed-back loops are employed.

DMO is a good case study of the failure of 'new age' flattened, downsized, and de-skilled organisations that now rely upon the outsourcing of functions that are inherently 'not contractable'. The difficulties that DMO still faces after more than a decade may be traced directly to:

- A lack of the core skills and competencies required for the successful management of high technology projects, together with
- the continued use of contract-centric ('quasi-business-like') processes as the primary project management vehicle rather than established and proven project and engineering management systems and procedures.

Redressing the adverse effects arising from the misapplication of outsourcing need not be complicated, and must be done if Australia is to again become a 'smart' nation with the skills and competencies base required now and into the future. Government must restructure and resource our education and training systems to inject quality over quantity, while enterprises must revalue technological skills and competencies and ensure that the roles and importance of engineering management are recognised and reflected within their management structures.

Finally, sound management principles and practice need to be ingrained at all levels as these form the foundations upon which all other competencies rest.

END NOTES.

1. Roach, Stephen S, (http://hbr.harvardbusiness.org/search/Stephen+S+Roach/o/author). Stephen Roach has written on the critical distinction between efficiency and productivity. He also emphasises the importance of educational attainment as a good measure of the return on investment on human capital, and points to the decaying standards in the US, a trend also noticed in Australia.
2. Over recent years, the role and performance of Master of Business Administration (MBA) graduates have come under scrutiny. However, it should be recalled that MBA schools were originally established some 60 years ago by Harvard University to give engineers management training so that they could more easily move into senior executive positions. Since then, rules for admission to MBA courses have been relaxed to the extent that students with almost no management experience, let alone engineering qualifications, are routinely admitted. The result has been to graduate MBAs who lack any solid skills base. In short, management training is important, but it has to be built on a solid skills base.
3. Grove, Andy. How America Can Create Jobs, Bloomberg Business Week, 1st July 2010; Grove, an ex CEO and currently Senior Advisor, Intel, highlights the full effects of outsourcing overseas on jobs, loss of technology know-how, breaking the chains of experience, and the organic and innovative evolution of technology.
4. Course, Ronald, who won the 1991 Nobel Prize in Economics for his theory on 'core', 'non-core' and 'contractable' outsourcing in terms of the 'transaction costs' involved. Course sees

the term 'outsourcing' as being misleading, as every outsourced task is accompanied by the responsibility to manage that task properly. The responsibility for a task may thus be moved to an outside contractor, but primary accountability for the task and its quality must always remain with the outsourcing enterprise.

5. Cecily A. Raiborn, Janet B. Butler, Marc F. Massoud, Outsourcing Support Functions: Identifying the Good, the Bad, and the Ugly. Discusses the need to manage the related strategic, quantitative and qualitative risk factors associated with outsourcing. Product #BH337-PDF-ENG, 15 July 2009.
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10. Cramm, Susan D., Where Are Tomorrow's IT Leaders?. Blogs.hbr.org/hbr/cramm/2010/08, 9th August 2010. Expands upon 9.
11. Software programming, data entry, processing and storage for major corporations are now done routinely by overseas contractors. 'Cloud computing' is an extension of this trend, driven by an increasing demand for speed and volume. While such technological developments may seem irresistibly attractive, they carry major challenges to the outsourcing enterprise in stating their management requirements and assessing the risks involved in managing the outsourced task. 'Cloud computing' is where the computing function itself is delegated to a large number of servers owned by a small number of global vendors. (htpp//blogs.hbr.org/cs/2009/08/outsourcing_where_will_you_dra.html)
12. www.theaustralian.com.au/news/opinion/more-dodging-of-cost-benefit-tests/story-e6frg6zo-1225928592812.
13. Recent Australian National Audit Office (ANAO) Reports highlighting the difficulties being encountered in managing outsourced functions by government include:
    ANAO Performance Audit Report No 8 – Multifunctional Aboriginal Children's Services (MACS) and Creches,23 September 2010.
    ANAO Performance Audit Report No 9 – Green Loans Program, 29 September 2010.
    ANAO Performance Audit Report No 11 – Direct Source Procurement, 30 September 2010.
    ANAO Performance Audit Report No 12 – Home Insulation Program, 15 October 2010.
14. www.theaustralian.com.au/politics/monster-we-could-not-tame/story-e6frgczf-1225809427399.
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17. ANAO Report No 37, 2008-09 – Lightweight Torpedo Replacement Project Report. This is one of many covering specific DMO major projects.
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ANNEX C

ANALYSIS OF

PROJECT DATA SUMMARY SHEETS (PDSSs)

THE SHEETS THAT FOLLOW ARE BASED UPON

THE PDSSs FORM THE

DMO MPR 2008-09

UPADTED TO INCLUDE COMMENTS COVERING

DMO MPR 2009-10

ATTACHMENT 1 PROVIDES A MEASURE OF THE RISK CONSEQUENCE LEVEL FOR EACH PROJECT, BASED UPON DMO AND AUSTRALIAN RISK MANAGEMENT STANDARDS

AIR WARFARE DESTROYER BUILD

General.

Comments on this project were included in the author's analysis of the 2007-08 DMO MPR, although the project was not included in that MPR. These included:

- Operational analysis of longer-term threats suggests that the project's capability expectations are overly ambitious when emerging regional air power and anti-shipping missile (supersonic cruise and ballistic) capabilities are factored in.

- The solution seen by Defence/DMO as ensuring that this project avoids the fate of earlier major projects has been the establishment of yet another layer of bureaucratic review – the establishment of an Air Warfare Destroyer Alliance Principals' Council.

Summary Comment on 2008-09 MPR:

The Air Warfare Destroyer Project is in extreme danger of failing for the following reasons:

- The decision by Defence/DAO/DMO to abandon due diligence in the management of major projects, which led to proven Project/Engineering/Risk/IV&V Management systems and procedures being avoided, 'dumbed down', and made subservient to contract management, left Defence/DMO open to pressures from manufacturers and open to subjective decisions taken at ministerial and departmental levels. This is a generic problem common to all projects now managed by Defence/DMO.

- The adoption of a new contracting methodology that has not been proven to be appropriate for high technology military systems. This will introduce yet another data base from which DMO and ANAO will have to try to retrieve meaningful project status data.

- A critical dependency upon developing and commissioning a new dockyard from a 'green site' to meet project milestones.

- The absence of an agreed Certification Basis and agreed Certification Plan at the time of contract signature, without which no project should proceed to contract signature.

- The reliance upon a higher review organisation lacking in required competencies, and an 'external facilitator'.

Comment on PDS Content.

Although listed as an Acquisition Category 1 project, which means that it will require extensive project and schedule management, and have very high levels of technical difficulty, there is no mention of just how these challenges will be managed, resolved, and reported in an objective, accurate, timely and auditable manner.

Defence/DMO has chosen to trial an Alliance-based contracting methodology for this project on the basis of its having been used successfully on a museum and a highway project. Just how this approach is seen to be appropriate for a high-technology naval capability, with its unique systems engineering integration challenges, is not explained. The additional organisational and functional interfaces that will have to be negotiated must only add to project risk

Alliance contracting has become a popular funding model for government infrastructure projects, aiming to share the risk of cost over-runs between government (the taxpayer) and the private sector. In practice it seems to simply shift financial risk back to the taxpayer. A recently-commissioned Victorian Treasury study found that so-called alliance contracting costs blew out between 48% and 55%, the highest of the three funding models studied.

This finding is not surprising, as any contract, particularly those involving high technology systems, are prone to cost over-runs if the customer does not have the required project and engineering management competencies appropriate to the technology involved. Governments, and DMO, fall into this bracket, as they focus upon the wrong risks. Not having the project and engineering competencies required, they fail to manage properly the risks associated with capability, schedule and cost. They concentrate upon the risk (liability) to the contract without understanding that risks are embedded mainly in the technical (capabilities) and schedule areas.

This new contracting approach will, as stated by DMO,' *have to be used on a number of projects before all lessons will have been learned*', so will be in a trial mode. This approach must be assessed as only adding new and unidentified risk to those projects upon which it will be used.

Within the complex management structure devised for this project, it is difficult to identify the project and other management skills and competencies that DMO will bring to the table.

Major Challenges.

The six major challenges listed are so elementary as to be hardly worth mentioning. DMO should, at this stage of the project, and after some ten years of experience, be able to better qualify and quantify those major areas requiring project, engineering and risk management focus.

Schedule Performance.

DMO states: *"Progress to achievement of planned in-service dates for the three ships and their support system is as scheduled"*.

Capability Performance.

DMO states: *"The current status is that planned capability will be achieved"*.

Both schedule and capability assessments must be considered as being prematurely optimistic, subjective, and of little value, particularly in view of the significant, if unqualified and unquantified, problems lurking under 'Major Project Risks'.

Major Risks, Issues and Linked Projects.

The items included in this section are too broad and are seen primarily from a contract aspect. Most are merely generic risks, lacking in capability, schedule and cost focus. The project would be difficult enough to manage if it were built in an experienced, working shipyard, but to expect a new and competent shipyard becoming available from scratch to meet project milestones, is beyond optimism. The skills and competencies that must put in place have been greatly underestimated.

Finally, any project that '*does not have an agreed Project Certification Plan and Certification Basis'* should not proceed as it embeds certain and indefinable risks. The absence of such basic pre-requisites for executing a minor, let alone major capital equipment procurement contract was the

root cause of the SEA 1411 Super Sea Sprite debacle, the Collins Class Submarine misadventures and the continuing challenges within the Wedgetail AEW&C Project, to name but a few.

Have these lessons been learned? Clearly not.

Key Lessons Learned.

While hardly classifiable as a 'lesson', this section is important in that it warns "*that it takes time and effort to develop the culture necessary to achieve improved outcomes"*, and advises that an invaluable external facilitator has been engaged to help make the Alliance work. This attitude seems to fit into DMO's '..*hope that over the next five or 10 years of this (MPR) report you see a transition where things do not happen anymore or when we mitigate some of those risks"*, as given in evidence at the JPCAA hearing into the 2007-08 MPR on 19th March 2009. Australia can hardly be expected to accept a continuance of these 'things' which impact directly the country's security.

Project Maturity Score and Benchmark.

See body for analysis for an assessment of the usefulness of these scores.

COMMENT ON 2009-10 MPR

Major Challenges

The 2009-10 MPR now lists five challenges which remain generic in form and provide no insight as to where specifically the challenges are or what might be planned to meet them. For example, "Ensuring that Navantia's production drawings are able to meet the requirements of the three shipyards in Australia while minimising the impact on production for the Shipyards.", masks an apparent failure of DMO's AWD Project Management organisation to ensure that the Prime Contractor's drawing system is known and followed by all involved in the project, especially the three Shipyards. Any incompatibilities (Contractor interface problems) or deficiencies in drawing control will impact directly the engineering integrity of the design and its production, and will compromise the configuration baseline, causing widespread problems. Importantly, MPR 2009-10 omitted the faulty construction of the first central keel block at BAE's Williamstown Shipyard, which, prima-facie, indicates a serious failure in drawing/production process specification control.

In addition, the second new challenge, "Managing expectations about changes to the existing platform design in order to avoid design changes which are not essential.", suggests that the system performance and engineering specifications being used are inadequate, and that there is also an inadequate change management system.

Both new challenges need to identify what is missing in AWD project planning and take corrective action promptly.

Schedule and Capability

DMO foresees no schedule slippages, despite the keel block problem and delays in production at BAE due to late contract award and the major risks recorded.

DMO assesses capability will be delivered on schedule, although two systems will not become available until 2017-18.

Project Risks

This section now includes emergent risks that have surfaced during 2009-10. In brief, these include:

- ***'Production efficiency compromised by skilled labour shortages necessitating embedding resident contractor teams'. Project planning would be expected to determine whether all involved have the workforce with the required skills and competencies before going ahead.***
- ***'Indexation gaps between contracts may increase costs'. Contract Terms and Conditions normally include aspects such as this, and should be settled before contract signature.***
- ***'Supportability data are insufficient to ensure adequate support'. Supportability should come under a Project Management Plan Sub-PLan. Supportability planning is an iterative procedure, based upon the evolving System Configuration Baseline an an established Maintenance Policy driven by the manner in which the system will be operated and supported. Supportability should be planned to be in place by the time the system enters service. In this, and other projects, DMO does not appear to understand the basics of how sustainability is managed under project management procedures.***

The awarding of a Measures of Effectiveness Score of 100% at this stage, when no measurable capabilities have been delivered, borders on the over-optimistic.

Project issues and Lessons Learned

The major project issues and lessons learned indicate a lack of emphasis or understanding of the role and importance of project management over contract management in the acquisition and sustainment of military weapon systems. The three Lessons Learned have been given a Category of Systemic Lessons of Governance, Resourcing and Contract Management – no mention of project management lessons.

Project Maturity Scores

The project has now been given a Project Maturity Score of 51 against a benchmark of 50. The score for Requirement is now given as 8 against a benchmark of 7, despite one of the major challenges being an unstable requirements baseline.

Project Risk Level (See Attachment 1)

In the light of DMO's continued difficulty in managing complex projects, especially those with integration tasks, this project has the potential to reach the highest level of project risk of Severe/Catastrophic.

BRIDGING AIR COMBAT CAPABILITY
(Refer also body of this analysis and Annex B)

General.

The background to this project re-writes some of the history of its birth, but does classify it as a *'directed government solution*'. However, it is important that this project be seen as part of Australia's New Air Combat Capability (NACC).

The Super Hornet, an aircraft rejected by other Western nations as a fighter replacement, was marketed robustly by the maker to Defence and Government and was purchased abruptly as a 'no brainer', against the advice of Air Force. Both Government and Defence had been provided with substantive data and analysis that showed that the aircraft would not be able to guarantee regional air superiority, as required by government policy. However, Manufacturer's promises were accepted without question, even where they conflicted with the basic laws of physics.

As a result, the decision was criticised severely by the Leader of the Opposition and the shadow Minister for Defence before the last election, both promising to rectify what was wrong, and many hoped that this would occur.

The new Minister for Defence, Fitzgibbon, soon initiated a two-part review of Defence/DMO New Air Combat Capabilities planning – the first covering the decisions taken in regard to the unnecessarily early retirement of the F-111 and the decision to purchase the Super Hornet – Part 2 would later review the Howard Government's JSF decisions.

Part 1 of the review was conducted internally by Mr Neil Orme of Defence. Mr Orme was provided with substantial personal and written submissions by individuals and Air Power Australia, which analysed and detailed the areas of risk associated with the New Air Combat Capability decisions being taken by Defence, including the JSF Project. He also had the many US governance reports issued over the years to guide him. These submissions and reports were simply unacknowledged and totally ignored, despite continuing assurances that Defence welcomed open discussion of its plans and programs. The failure of Defence/DMO to take note of the extreme risks associated with the aircraft may be measured by comparing the content of the Orme Report and the presentations made.

Since then, Government, Defence, and DMO have been kept abreast, in detail, of the many areas of risk associated with the JSF Project, but no risks have been admitted by Defence/DMO or apparently by the over fifty 'specialists' involved with the JSF and NACC projects. All Defence/DMO statements have merely repeated the clearly discredited statements emanating from the manufacturer and the US Project Office which have always marched in 'lock step'. The JSF Project is analysed in more detail in the body of this analysis.

The Minister's decision to remain 'Hornet Country', an aircraft ignored by other nations in search of a high capability air combat aircraft, and Defence/DMO's blind commitment to the JSF will not only enshrine Australia's inability to exercise air supremacy in our region, but will condemn Australia's management of defence capabilities in the eyes of the world. This subject is analysed further at Annex B.

Lessons Learned.

The Key Lessons Learned simply record basic knowledge that the RAAF possessed some 70 years ago.

Collateral Damage.

The Super Hornet Project continues the destruction of Australia's military capability skills base:

- First, Australia lost the high technology skills and competencies base that had been built up at Amberley, QLD, to support the F-111 Fleet, including systems integration and embedded software/hardware development, when the aircraft was prematurely retired. These core skills, which were critical to the support of Australia's future air combat capability, were abandoned by Defence.

- Second, similar, albeit less developed support facilities and competencies established at Williamtown, NSW, for the F/A-18 Fleet will be largely disbanded as the Super Hornet, with its overseas support contract, comes into service and the current A/B models deteriorate. This will leave another major hole in Australia's air combat support capabilities.

- Finally, when the AP-3C Orion is replaced by an aircraft supported by overseas contractors, Defence will direct that the Edinburgh, SA, support facility be disbanded, and with that will go the last of Australia's major local support capabilities.

This is the inevitability of Defence/DMO policy to let supply and long term support contracts to foreign companies having no business reason to set up support facilities in Australia. Defence/DMO policies are based upon a perceived reduction in cost and risk, which will, in the end:

- Greatly increase cost.
- Result in the further debilitation and de-skilling of the Services and Australia's defence industry.
- Lead to the collapse of Australia's defence self-reliance.
- Greatly increase risk to Australia's security.

Guaranteed!

COMMENT ON 2009-10 MPR

Subsequent to the above, the US record of discussion, approved by the US Secretary for Defense, advises that the Australian Minister for Defence at the time "expressed his opinion ...that the review (into the purchase of the Super Hornet and commitment to the JSF) would likely not result in any decision other than to keep the JSF and continue with the Super Hornet purchase, explaining that the Government felt it had to respond to Australian public concerns that the previous government had not based these decisions on capability requirements but rather on political expediency." This may explain why the substantial technical advice and operational analysis given Government and the DMO was totally ignored.

Capability Status and Lessons Learned

No deficiencies in operational capability have been recorded, but the delivery of facilities and Support and Test Equipment needed to support initial operations are outstanding, which must impact capability. Resourcing and Requirements Management are given as the Category of Systemic Lessons arising from this project.

MULTIROLE HELICOPTER

General.

This project has been entered into too early and planned inadequately due to a lack of in-depth experience with helicopter technology and an absence of sound project management disciplines. This parallels problems observed in Europe with the same basic NH90 design, detailed in the February, 2010, disclosure of the highly critical BundesWehr Luftlande- und Lufttransportschule (Airborne and Air Transport School) operational suitability assessment report, which recommends “using alternative aircraft whenever possible in an operational scenario”.

This is highlighted in, for example:

- The immaturity of the design, requiring costly retrofit to achieve the required capability.
- A lack of understanding of the role and functions of configuration management in identifying and quantifying support requirements accurately and timely, for example, spares and technical documentation.
- An inability to coordinate project milestones, evidenced by the inadequate flying effort achieved, which has also impacted Service flying training.
- Failure to analyse system and equipment reliability against the configuration baseline as it matures, a basic function of project management which drives requirements for manpower, skills and training, technical documentation, repairable items and breakdown spares, facilities, tools, test equipment, and so on, to meet the unique support needs of the Service operating the equipment.

This project seems to have been driven by schedule at the expense of capability and sustainability.

Maturity Scores and Benchmark.

A total score of 57 against a benchmark of 57 hardly reflects reality. The question of the value of these scores is analysed in the body of this paper.

Risks.

Although mostly identified as “There is a chance...”, the major risks listed do give a better insight than many projects. However, they are still at too high a level and are all problems that should have been identified and managed (fixed) under standard project engineering procedures.

Each 'risk' begs the question:

'How and why did this happen?”

The answers to that question would have led to the real 'lessons learned' being identified and the appropriate corrective action taken for that project and for future projects.

Finally, the remedial actions given for each of the 'risks' identifies a lack of understanding and application of the standard project/engineering management procedures that must be applied rigorously and consistently on every project. In the absence of responses to the question raised above, the lessons learned provide no insight as to why these 'risks' and 'issues' occurred and how they might be corrected for the future.

COMMENT ON 2009-10 MPR

The 200-10 MPR now gives the project a total score of 61 against benchmark of 57 for delivering the ISD capability.

However, new major challenges that have now arisen include:

- ***The aircraft has had to be delivered in "progressive capability configurations as systems are matured and certified...".***
- ***Progress in important areas has halted due to an engine failure and investigation.***
- ***The Aircrew Information Set (the Flight Manual and Check List) is unsuitable for Australian conditions and has to be re-written accordingly.***
- ***Problems have led to the IOC being delayed by 12 to 18 months, the Navy now being Jun 2011 and the Army Oct 2012.***
- ***The six major risks that have arisen over 2009-10 have resulted in aircraft being accepted that do not meet the required capability and will thus have to undergo block capability upgrades. These in turn will also impact acceptance certification, training, the withdrawal of the Black Hawk and Sea King aircraft, the aircraft's IOR, and require voids and porosities in the tail sections to be rectified.***

The nexus between the Project Maturity Scores and reality is thus a mystery.

Key Lessons Learned

The key lessons learned are merely categorised as stemming from Resourcing, Contract Management, and Off-the-Shelf Equipment. No mention is made of a lack of helicopter technology competencies and skills, or any lack of project management skills and competencies.

This project has fallen to almost every risk that can arise, and was fated before it started.

Finally, there is no indication DMO heeded the clear warning delivered by the German Airborne and Air Transport School, which recommended:

"Using alternative aircraft whenever possible in an operational scenario."

AIRBORNE EARLY WARNING AND CONTROL AIRCRAFT

Capability Performance.

Comments on this project were included in the author's analysis of the 2007-08 DMO MPR.

"Integrated system performance is currently not meeting specification. … However, remediation of all radar performance shortfalls is not expected to be achieved by final delivery of the system". The project is some four years behind schedule, so should be able to provide many useful 'lessons learned'.

Major Project Risks.

As for so many other projects, the risks recorded are generic and have not been tested by the simple question: "*How and why did this happen?*" so as to get to their root cause(s) and identify the corrective action needed.

Lessons Learned.

All 'lessons learned' fail to provide answers that can be used to modify management systems and procedures to prevent future occurrences, as they are couched in subjective, generalist terms rather than objective, management terms. The project still reflects inadequate management systems and technical expertise.

Contractor Support - Good Value for Money?

Considerable concern is felt in regard to the Minister's recent statement regarding the Wedgetail Through Life Support Contract. The fundamental question relates to how DMO determined that the contract provided good value for money. When the RAAF managed its own operating, intermediate and deeper maintenance facilities and contractors, determining contract scope and value for money was relatively straightforward and accurate. As DMO cannot fall back on that hands-on experience, the way in which DMO determines whether Australia is getting value for money needs to be better explained and made transparent.

A first look by an ex-RAAF engineer officer with project and maintenance management expertise points out:

- The contract for $A800 million for provision of *"Services including logistics, training, spares management, aircraft deeper maintenance, engineering and supply chain management*" for six Wedgetail aircraft over five years comes nominally to about $A26.7 million per aircraft per year.

- In contrast, the Boeing F-111 Weapon System Business Unit contract provided services, including logistics, training, spares management, aircraft deeper maintenance, engineering and supply chain management, including numerous SME sub-contractors, plus capability enhancements, at a total average support contract cost of about $A100 million per year. For the fleet of 27 aircraft, this amounted to about $A3.7 million per aircraft per year. With, say, an average of 12 mission-ready aircraft on line, this amounted to about $A8.7 million for each aircraft per year. Even going down to the six aircraft on line during later years, the cost comes to $A16.7 million per aircraft per year.

While some may argue with the comparative scope and costs quoted, the figures give a reasonable AEW&C Contract to be good value for money. One has also to factor in the reduced visibility and control of activities that impact directly force capability readiness and sustainability that come with DMO's support contracts, as well as the dwindling skills base of the Services and our defence industry base, and Australia's self-reliance.

COMMENT ON 2009-10 MPR

The IOC and FOC for this project have been left unchanged, whereas:

- ***The radar, the system central to key capabilities required of this weapon system, has been excised and made the subject of a separate re-mediation program, and***
- ***Further technical challenges in the development of the Electronic Support Measures (ESM), Electronic Warfare Self Protection (EWSP) and ground support systems are also expected.***

As a result, "Overall technical and schedule risk is assessed as high."

While a revised schedule baseline has been struck, it is still not possible to determine when full AEW&C capabilities will be provided, thus the IOC and FOC dates given cannot be achieved in accordance with their accepted definitions.

The dates given are thus unreliable and misleading.

Lessons Learned

Seven lessons are recorded, attributed to:

- ***First of Type Equipment (2).***
- ***Schedule Management (1).***
- ***Contract Management (3).***
- ***Resourcing (2).***

It is important to note that not one lesson has been attributed to deficiencies in engineering expertise, or the absence of robust project/engineering management. This project started along sound project and engineering management lines, but these were replaced by generalist-driven, contract-centric, administrative process, with the inevitable results now seen. The technical scope and difficulties inherent in such a project were not identified and managed properly from that time.

This project has been at a Risk Co0nsequence Level of Severe/Catastrophic for two years.

AMPHIBIOUS DEPLOYMENT AND SUSTAINMENT (LANDING HELICOPTER DOCKS)

Status.

The Project Summary states that the project is within budget, on schedule, and delivering the required capabilities. The project thus gives itself a maturity score of 45 against a benchmark of 45.

Major Risks.

However, the optimistic Summary above has to be read against the five major risks being encountered, covering potential regulatory changes, changes in requirement, inability of the combat system to meet performance requirements, possible damage to propulsion pods, and inadequate funding for sustainment.

Each of these should have been qualified and quantified in terms of problem or risk, and appropriate project/engineering/risk management actions planned and taken. The piecemeal remedial actions proposed will prove to be inadequate in the absence of such management actions.

Major Project Issues.

The integration complexity highlighted will almost certainly test the management of this project, but the remedial action proposed does not generate confidence that the management of engineering complexity is understood. The project, at this stage must thus be given a low probability of succeeding.

COMMENTS ON 2009-10 MPR

The 2009-10 MPR identifies a number of broad risks, both potential and emergent, as well as several Major Project Issues. These reinforce the assessment that this project will be a severe test for the management methodology being followed, and that the probability of success is low.

The IOC and FOC are now both planned for Nov 16.

The Risk Consequence Level for this project is now at Major, with the potential to reach Severe/Catastrophic.

ARMED RECONNAISSANCE HELICOPTER

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR.
This project has experienced the range and type of difficulties that usually stem from incoherent project/engineering/risk management.

It is noted that $A6.5 million has been 'harvested' from this project, but whether this forms part of the Defence Strategic Reform Program is not revealed, nor have the impacts that will arise from the cuts.

The detail on this important project does not make good reading. It reinforces the impression that the project was scoped inadequately, and not resourced and managed properly. Where 'project planners' are mentioned, it appears that their functions relate more to contract administration than coherent project/engineering/risk management.

Major Challenges.

The major challenges listed reflect tasks that should have been handled in the project management sphere, the systems engineering sphere, and the support engineering field respectively.

For a project that is said to be 27 months later than originally planned, with some major elements up to 62 months late, has been re-baselined, and is still facing considerable challenges, to be assessed as "*still expected to deliver the required capability within the approved budget*" stretches credibility.

Risks, Major Issues and Lessons Learned.

Again, these sections give insufficient insight as to how and why these risks and issues arose, and the lessons learned do not get to the nub of the problems so as to be able to correct them in a timely way and feed changes back into management systems to ensure that they are managed properly on future projects.

COMMENTS ON 2009-10 PR

This MPR highlights:

- ***Inadequate repairable and breakdown spares support.***
- ***Australian Aerospace's inability to deliver aircraft from production and its retrofit lines on time.***
- ***Type acceptance tests are still continuing.***

The stated achievement of the Initial Operational Capability in Sep 09, in the form of an "Initial Operational Test and Evaluation Readiness Milestone", is difficult to accept under the military definition of Initial Operational Capability (IOC). Similar difficulties arise in accepting a Project Maturity Score of 58 against a benchmark of 57, and a schedule score of 9 against a baseline of 8, on a project that is at least 27 months behind its IOC schedule and 42 months behind its Final Operational Capability (FOC) schedule. Statements such as these exemplify the gap between reality and DMO's assessment of its own performance.

Lessons Learned

These relate to the following Category of Systemic Lessons: Off-the Shelf Equipment, Resourcing, and Contract Management, with no mention of any project or engineering management problems. One lesson relates to a need for "The use of integrated teams with with strong processes and empowered staff facilitated by appropriate contractual arrangements.", and another to " Resolve or escalate minor disputes as they arise to prevent escalation to major contract dispute." Both identify a lack of adequate Project/Engineering Management, and a primary focus upon contract over project management.

This project has been at a Project Risk Consequence of Severe/Catastrophic for the past 18 months.

AIR TO AIR REFUELLING CAPABILITY

General.

"Airbus Military's ability to meet the contracted schedule milestones continues to be the greatest challenge due to an underestimation of the overall scope and complexity of work and system improvements introduced during the development".

This situation is indicative of a project that was embarked upon when inadequately scoped, planned and resourced with the required skills and competencies, and proceeded without sound project / engineering / risk management systems and procedures in place. The usual over-reliance upon contract management and contractor support for tasks that must be managed by the customer is also evidenced.

Major Risks, Issues, and Lessons Learned.

The risks and issues listed provide better than generic statements and highlight a number of risk/problem areas that should normally have been identified in time and mitigated through standard project/engineering/risk management procedures before they emerged as real risks/ problems/issues.

There is still a confusion between risks, problems, and 'issues', the latter term these days being used to describe any number of unqualified and unquantified 'things'. The word 'issues' should be discouraged at all levels in project management.

Again, the risks and issues listed have not been tested to identify the root cause(s), and so the 'lessons learned' are not of much use in the practical project management sense of ensuring that they do not cause problems for future projects.

Comment on 2009-10 MPR

This program has slipped further due mainly to "Underestimation of the overall scope and complexity of work and system improvements introduced during the development.", coupled with difficulties with the development testing and the achievement of civil certification.

The aircraft will be now delivered and accepted carrying a number of non-compliances against "the minimum requirements of the Initial Operational Requirement." Despite this, the Measure of Effectiveness given at Page 240 is 100% green – that is, meeting the capability requirements specified in the Materiel Acquisition Agreement.

Three pages of the MPR (241-243) identify a range of Major Project Risks and Major Project Issues, and record many Lessons Learned, including:

- ***Delays in developing the Human Machine Interface.***
- ***Delays in agreeing how non-compliances will be managed.***
- ***Problems with aircraft acceptance.***
- ***Difficulty in developing a reliable schedule.***
- ***Schedule delays at the Australian Conversion Centre.***
- ***Hardware and software for major refuelling components are still in the development and test phases.***
- ***Training delayed by development testing.***
- ***Requirements still being developed for the Mission Planning System***

All of these are problems that are managed best under Project/Engineering systems; they will not yield in time, cost or capability to contract administration processes.

Key Lessons Learned

These relate to:

- ***Poor initial assessment of the technical challenges involved, especially integration of systems, software integration, and development and testing.***
- ***Lack of a robust design maturity assessment.***
- ***Inability of the Contractor to support* customer requirements.**

While all of these fall within the scope of project management, the Categories of Systemic Lessons given them are: First of Type Equipment, Schedule Management and Contract Management.

This project now has a Risk Consequence Level of Major with the potential to rise to Severe/Catastrophic.

The Risk Consequence for this project is now Major, with the potential to reach Severe/Catastrophic.

HORNET F/A-18 UPGRADE – PHASE 2

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR.
This project faces several 'risks' which seem to be managed through an amalgam of project office and contractor activities.

The key lessons learned reinforce this impression, as the majority of the activities listed for contractors and Product Teams are normally core project management functions that rightfully belong to the customer, the DMO Project Office. This arrangement also highlights the many different approaches adopted by DMO, which are more contract than project management focussed, ***giving*** rise to the problems faced by ANAO/JCPAA in trying to get objective and consistently accurate and comparable project status information across projects.

A key concern with this project, as well as Phase 3.2 of the Hornet Upgrade Program, is the cost effectiveness of the work being done as an element in Defence's NACC planning, faulty as that planning might be. ***The extent to which this project will extend the fatigue life of the Hornet fleet has yet to be proven, especially in the light of the continued problems being encountered by the JSF, which will require the current aircraft to fly even longer.***

Notable by its absence is any mention of the failed approach taken by the DMO in Air 5376 Phase 2.3 in, against strongly founded technical advice from within Defence and Industry, the then Head of Electronic Systems Division of the DMO with the support of the then Under Secretary of the DMO, ensured the selection of an extremely high risk solution Radar Warning Receiver (RWR) System (the ALR-2002) over the recommended ALR-67 Version III RWR system, which is only now being installed into the F/A-18 Hornet aircraft.

This decision resulted in over 5 years and some (estimated) A$440 million dollars of project capital budget funds being wasted, along with the commensurate personnel, travel and subsistence, and related costs associated with the ‘project management’ of this fraught solution. An estimate of the overall wastage of Commonwealth resources s would put the amount, conservatively, at well over half a billion dollars.

Major Risks and Issues.

Two major risks/issues are recorded for both Phase 2 and HACTS under '*There is a Chance...'*. Remedial action in all cases is contract centric. Under project management procedures, each 'risk' would be classified as a problem or a risk and if a risk, the classification of that risk and the manner in which it will be managed under project management procedures.

Key Lessons Learned.

These generally relate to what contractors are to do and contract management activities. Many of the activities recorded are DMO Project Office functions, as DMO carries accountability for the visibility and control of all project/engineering/risk/IV&V activities.

COMMENTS ON 2009-10 MPR

This MPR highlights:

- ***Long-term aircraft availability may be affected by fatigue that will impact aircraft***

capability.

- ***The capability of the Project Office will be affected by the loss of critical staff.***
- ***The inner wing aft closure rib will not achieve its full life.***
- ***A lack of repairable items, which should have come under a project sub-plan for sustainment.***

Lessons Learned

These relate to the need for integrated teams, and better contract management, which would normally come under Project/Engineering Management, but have been given Categories of Systemic Lessons of: Governance, Resourcing, Schedule Management and Contract Management.

The loss of Project Office skills is in line with the continuing de-skilling of local, especially RAAF, skills and competencies as Hornet engineering, maintenance management and supply support moves off-shore under DMO's total system support contracting methodology.

While shown as on schedule, the project still faces risks.

C-17 GLOBEMASTER HEAVY AIRLIFTER

General.

This project lost about a year because essential operational equipment was not delivered with the aircraft, as it would normally have been under pre-DRP/CSP RAAF management.

This failure indicates poor or absent project management procedures in that support requirements were either not identified in the operational requirement and/or support requirements specification, and were not included in the project management support plan.

Again, the risks stated and the lessons learned do not identify just how and why these things happened and how they might be avoided on future projects.

It should not take "*a couple of years to develop up the sustainment"* as DMO advised the JPCAA Hearing of 19th March 2009. Pre-DRP/CSP, RAAF showed how sustainment requirements can be integrated into Project Planning and managed such that all sustainment requirements are in place by the time an aircraft/system arrives in country.

Finally, the support contract entered into for this aircraft should be tested to see whether it provides value for money. The USAF certainly found its contract far too expensive and sought changes. Is DMO's contract costing too much?

COMMENTS ON 2009-10 MPR

This MPR states that full capability is being delayed by outstanding long lead-time support. This should have been determined, procured and delivered earlier in the project to coincide with the arrival of the aircraft, as would have happened under normal RAAF engineering management. The equipment outstanding includes: role equipment, Cargo Compartment Training Service, Ground Support Equipment, and Facilities.

Against this, the Project Maturity Score given is 67 against a benchmark of 67, a 'Traffic Light' measure of 100%, and the statement "Project activities have been achieved on schedule."

The Key Lesson Learned has been categorised as 'Military Off-The-Shelf'.

In fact, the project is now 11 months late and has a Project Risk Consequence of Major.

GUIDED MISSILE FRIGATE UPGRADE IMPLEMENTATION

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR.
This project experienced serious problems which DMO failed to identify in nature, extent, and impact, so that timely and effective action was not taken and the real lessons learned were not identified and used to good effect on future projects.

Delays in achieving Initial Operational Capability (IOC) are recorded as being 55 to 71 months, and Final Operational Capability (FOC) from 48 months to 65 months, and then only after reaching a *'pragmatic agreement with Navy'*, the nature and impacts of which are not revealed.

Major Risks and Issues.

Although all assets are recorded as having reached their FOC during December 2009, this section reports that "*There is a chance that...*"

- The Combat System Software may not meet contracted requirements.
- Upgraded systems may not have effective software support and configuration management in place.
- Upgraded systems may not have acceptable reliability and maintenance data which will impact capability and support.
- The Warfare Systems Support Centre may not be ready.
- The project may not meet current Navy Technical Regulatory requirements under the contract.
- The required Electronic Support System performance may not be met.
- The Torpedo Defence Systems integration and performance may not be met.
- The Hull Mounted Sonar may not meet performance requirements.

The remedial actions given are largely contract and outsourcing orientated. They reflect no sense of any firm project management control; for example, there is no sign of those core project management functions that relate to project planning, developing and managing the design and configuration baselines, or support requirements determination (there are many others of course). Against this background, a maturity score of 57 against a benchmark of 57 would, prima facie, seem difficult to justify.

Key Lessons Learned.

These lessons, as for the other projects reported, list the most basic competencies, without which no project should ever proceed. They are all indicative of a lack of even a basic understanding of project management and the competencies required. Peppered throughout this list are what contracts should contain and what contractors should do – hardly a word about what DMO should be doing to overcome the perceived 'risks and issues'; nothing about project/engineering/risk/IV&V management deficiencies within DMO. This project, like many, failed because it wasn't managed properly by people with the required management structures and competencies – it was managed by generalists using contract and business processes.

There is much to learn from this project, especially with the Air Warfare Destroyer Project coming along, as well as early planning for a Collins Submarine replacement. However, with DMO not being a true learning organisation, and being focussed on contract administration and process rather than project management and engineering, what is seen in these PDSs can be expected to continue.

COMMENTS ON 2009-10 MPR

This MPR advises that further significant problems have been encountered. The nine lessons learned exemplify a lack of rigorous and relevant project and engineering management skills and competencies. However, they have been given Categories of Systemic Lessons of:

- ***Requirements Management.***
- ***Contract Management.***
- ***Schedule Management.***
- ***First of Type Equipment.***

On present planning, this project will be at a Risk Consequence Level of Severe/Catastrophic for 7 years.

HORNET Phase 3.2

General.

The comments relating to the Hornet Upgrade Phase 2 Project relate also to this project.

Major Risks and Issues.

The Major Risks and Issues recorded relate to the unknown impact of fatigue damage and the lack of maintenance managed items to support the new aircraft configuration. The latter points to the failure to maintain close attention to the changes taking place in the aircraft's configuration baseline – a project management responsibility, to calculate the variations to fly away kits and maintenance pipelines, and ensure that timely notice is given of the new supply requirements- all tasks previously done by RAAF as a matter of course.

Of major longer-term concern is the fatigue state of RAAF aircraft and the soundness of future fatigue monitoring programmes as a result of DMO policy to include fatigue management in the maker's sustainment contract. RAAF and DSTO had an envious reputation for the fatigue management of Australia's military aircraft, a function now dispersed and outsourced. Defence/DMO will, hopefully, learn quickly that aircraft manufacturers face a problem in monitoring the unique fatigue spectra, fatigue damage and fatigue lives of each RAAF aircraft. The results can, in the extreme, impact flying safety (airworthiness), as well as Australia's air combat capability. Fatigue management of Australia's military aircraft should remain in Australia and be managed closely by Australians.

Key Lessons Learned.

These miss somewhat the objective of recording lessons learned for use in refining/changing management policies, systems, and procedures.

COMMENTS ON 2009-10 MPR

Key Lessons Learned

These relate to:

- ***The management of repairable parts.***
- ***The cost savings stemming from DSTO data re the centre barrels.***
- ***The additional work potential with ageing systems.***

The Categories of Systemic Lessons given them are: Schedule Management and Requirements Management.

This project is still doubtful in regard to its cost/effectiveness and faces latent risks in fatigue management.

BUSHMASTER PROTECTED MOBILITY VEHICLE

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR. The Critical Design Milestones for the Vehicle Initial Review run from 12 to 26 months late, depending upon vehicle type. System Integration now runs from 6 to 26 months late, while contractor Test and Evaluation progress is from 6 to 37 months over time.

Major Risks and Issues.

As reported, "*There is a chance*" that delivery of operational capabilities may be delayed by:

- Changes due to operational feedback (now retired).
- Delays in processing Engineering Change Proposals (ECPs).
- Changes required by the need for sustained towing.
- Complex requirements in the specifications for the development of the Protected Mobility Air Defence Variant due to new operational requirements and the effects of foreign sales.

The remedial actions given consist mainly of contractual activities and enlisting 'stakeholder' involvement. However, standard project management procedures should drive approved operational and technical requirements in a closely coordinated way, and in turn monitor contractor performance in meeting those requirements at specified milestones. Variations to project planning, including those recorded as risks and issues, are then coordinated controlled through the project management system, which in turn drives any necessary contractor/contract activity. This project seems to suffer from inadequate or ineffective project management, allowing the contractor to control the project.

The fact that *"Thales has provided an undertaking to consult the Commonwealth where any potential schedule conflict arises from other customer inquiries"* reinforces this impression.

Major Project Issues.

These relate to:

- The unavailability of wiring harnesses.
- The late construction of facilities, which raises the question as what advantages accrue from having Defence Support Group become involved in a project in which they have no specialist competencies.
- Delays in processing ECPs.
- A shortage of headsets compatible with the alternative wiring harnesses procured.

Three of these four would be expected to have come under standard project management procedures. The fourth, the lateness of the facilities points to one of many unnecessary and risk-laden interfaces that exist in all Defence/DMO processes.

Key Lessons Learned.

The three key lessons learned are as recorded, as follows:

- *In the early planning phases of the project, the operational concept and functional performance requirements were not clearly defined, making it difficult to understand and undertake appropriate cost-capability trade-offs.*
- *Cost Estimating – there was a lack of industry capability to provide adequate cost estimates and inability by Defence to evaluate the validity of the cost data.*
- *Testing program – significant contingency planning should be conducted for compliance testing of a new capability.*

These all indicate a lack of the most basic competencies required before a project can even be considered, and a total absence of any project management framework. That this project was allowed to proceed with these deficiencies is damning. It was planned to fail. In short, too much reliance upon contract administration and inadequate project/engineering/risk management, and no IV&V!

COMMENTS ON 2009-10 MPR

Over the past year, the IOC and FOC for this project have slipped, the project having encountered:

- ***Delays in design approval for the SOTASip harness.***
- ***Failure of Contractor's preliminary ECA design.***
- ***Lack of Government Furnished Materiel.***
- ***Delays in the construction of facilities.***
- ***Delays in processing and implementing Engineering Change Proposals.***

All point to a problem with project management and planning, but they have been given Categories of Systemic Lessons of: Contract Management, Requirements Management, and First of Type Equipment.

Despite the delays to both IOC (8 months for the PP1 and 4 months for the PP2) and FOC (37 months for the PP1 and 19 months for the PP2), DMO gives the project a perfect score against its benchmark and a 'Traffic Light' of 100% green.

The project now has a Risk Consequence Level of Severe/Catastrophic.

HF MODERNISATION

General.

Comments on this project were included in the author's analysis of the 2007 = 08 MPR.

Although this project records a delay of some 74 months for both Initial and Final Operational Capabilities, and 127 months for the Mobiles, the project still earns a DMO Project Maturity Score of 54 against a baseline of 55 – whatever that means.

Major Risks.

The two additional risks included in this report relate to the Fixed Network's failure to meet the contracted Grade of Service and Speed of Service, as well as inadequate software design documentation. Both problem areas are to be managed by '*working closely with, and monitoring, the contractor, both passive activities*'. There is no sign of any active project management here.

Major Project Issues.

The addition items included in this report covered:

- The Contractor's failure to meet the schedule has been 'fixed' by revising the schedule.
- Fixed Network software development had not achieved the agreed schedule.
- Contractor delays will delay completion of Mobiles upgrades beyond current project date.
- As a consequence of delays to final system acceptance, and the inability of Navy to provide needed operators, the project has had to get the contractor to fill the gap.

These are all indicative of a less than robust project management system.

Key Lessons Learned.

These remain unchanged from the 2007-08 MPR.

This project is symptomatic of one starting without an adequate requirements baseline, inadequate or missing project management planning, inadequate engineering skills and competencies, inadequate risk management, and no IV&V plan. Despite this, the project was allowed to proceed, relying solely upon contract administration.

COMMENTS ON 2009-10 MPR

Project Planning

Planning has undergone significant changes. The IOC was influenced by contractor delays with software development and system instability leading to deferral of operational capability. The FOC is now over five years late with some work being passed to Navy, again leading to deferral of operational capability.

The IOC is now 65 months late, and the FOC 120 months late, but DMO gives it a Maturity Score of 59 against a benchmark of 57, and a 'Traffic Light' of 100% green, with major risks and issues yet to be faced.

Lessons Learned

These include:

- ***Risks associated with the requirements instability, and importantly the statement that "A proper balance needs to be kept between proper engineering processes and contractor-perceived commercial imperatives to minimise risks that unrealistic technical programs will actually result in delays to the overall schedule."***
- ***Accessibility requirements have to be managed.***
- ***Milestone payments should be tied to deliverables with well defined objectives.***
- ***Substantial IT projects should keep abreast of emerging COTS solutions.***

All of these risks fall within the role of Project Management and integrated Engineering Management, and this project identifies and actually voices concerns about the absence of these disciplines. However, they have been given Categories of Systemic Lessons of:

- ***Requirements Management.***
- ***Contract Management.***
- ***Schedule Management.***
- ***First of Type Equipment.***
- ***Off the Shelf Equipment.***

This project has been at a Project Risk Consequence of Severe/Catastrophic and is currently assessed to be 10 years late.

ARMIDALE CLASS PATROL BOAT

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR.

The project seems to have been an attempt by DMO to be a 'smart' buyer by acquiring a commercial design that, seemingly, had only to be modified to meet RAN operational requirements. The chosen vessel however also required Navy to change its traditional crewing policy to fit the constraints of the commercial design.

The vessel has encountered serious design defects which have led to it being virtually 'black balled' by RAN sailors on both operational and safety grounds. Needless to say, Defence/DMO and the RAN hierarchy have lauded the vessel.

Despite this, DMO's PDS states that "*All vessels continue to meet Navy's operational requirements*".

Progress to FOC.

The project is now 33 months late, due to outstanding defects. FOC is now estimated to be 2011.

Major Risks and Issues.

These are recorded, as follows:

- *Navy standards are different to commercial standards resulting in a risk to customer acceptance.*

- *Contractor inability to provide support vessels throughout the life of the in-service phase of the contract (performance risk).*

One would expect Navy to have had such risks well in view and under tight control at least ten decades ago!

Lessons Learned.

Both of the Key Lessons Learned are simply generic, and are symptomatic of a failure to follow established project management, engineering management, risk management, and IV&V methodologies from the beginning of this project to the end. This project highlights the the capital risks accepted by DMO in embarking on a project of medium complexity, relying wholly upon contract administration for its management. The project has cost Australia much in time, money, and compromised and late capability requirements, but there is no sign in this PDS that any real lessons have been identified and digested.

COMMENTS ON 2009-10 MPR

The Initial Operational Capability (IOC) dates for each of the boats were not specified by Navy until after acceptance of the boats for reasons not explained. The Final Operational Capability (FOC) date has now slipped a further three months due to latent defects requiring the boats to go through a rectification program. The FOC now given for this project is 3 years late.

Lessons Learned

These emphasise:

- ***The schedule did not allow time to determine the modifications needed to meet requirements, leading to a dynamic design baseline throughout the production phase that resulted in complication, expense and inefficiencies. This is given a 'Category of Systemic Lessons' of 'First of Type Equipment'.***
- ***Failure at project inception to determine Navy standards that the commercial vessel had to satisfy. This is given a 'Category of Systemic Lessons' of 'Requirements Management'.***
- ***Combining the acquisition and support of the fleet in one contract led to disputation and complications in managing defects where the prime contractor is not the ship builder. This is given a 'Category of Systemic Lessons' of 'Contract Management'.***

There is not one mention of inadequate project management, or the absence of sorely-needed operational and engineering skills and competencies to drive the project – as well as the contract. The Category of Systemic Lessons attributes these lessons learned to First of Type Equipment, Requirements Management and Contract Management.

This project demonstrates a lack of even a basic project management organisation with the relevant operational and engineering skills and competencies.

The contract-centric management approach adopted for this project has failed on every count and is still failing to this day, and yet DMO awards itself a perfect Measures of Effectiveness Score of 100%.

This project highlights almost every lesson in how not to manage a technology-based acquisition, especially a military one. It also demonstrates the uselessness of DMO's 'Lessons Learned' approach to obtaining management feedback.

The project has a Risk Consequence of Severe/Catastrophic, and is currently assessed to be 3 years late.

COLLINS REPLACEMENT COMBAT SYSTEM.

General.

Comments on this project were included in the author's analysis of the 2007 – 08 MPR.(1)

The project is recorded as now being six years behind schedule, which represents a significant part of the boat's life of type.

The operational capability of the Collins submarine depends upon the quality and reliability of its Combat System. One would thus expect everything possible would be done to select and commission the best system available. Unfortunately, for Australia's security, and the risk to those RAN members who will man and operate these boats, and be exposed to the hazards of war when required, the management of the Collins Combat System has to be condemned.

In response to the dilemma, DAO/DMO had reached in relation to the Combat system originally specified, an innovative South Australian SME accepted the risk and developed a combat system for the Collins submarine that was provided to Defence and has been installed on one of the boats for years.(2) This Australian designed combat system has never failed, can do more than the system selected, and costs a fraction of the very expensive American system. (3)

However, the locally designed system was ignored. Defence, DMO and Navy selected the American design because the US Navy threatened to cut off Australia's access to intelligence information if they did not commit to the American system. The American system has cost Australia hundreds of millions of dollars in addition to the hundreds of millions of dollars wasted on the original failed system. The system selected still fails to meet requirements, even after these were downgraded to 'help it across the bar'.

In the case of the Collins Combat System, Defence/DMO have weighed in their balance whether to accept a second rate combat system at remarkably high cost so as not to ruffle the feathers of our sister nation (or one of its Services), against accepting a locally-developed system that has proven to be far more capable and reliable than the US system, far less costly, and able to be developed further and supported in Australia. That they have selected the former alternative indicates clearly that the security of Australia and the safety of our Naval crews run a poor second on their scale of values.

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COMMENTS ON 2009-10 MPR

Lessons Learned

These relate to:

- ***Ensure adequate staffing is available, particularly if DMO is to be the prime system integrator.***
- ***Ensure project dependencies are established before the schedule is established.***
- ***Identify requirements for technical data and technology as early as possible.***
- ***Project management, cost, schedule and schedule risk are introduced in a joint development project.***

All of these are project management functions, but DMO has given them Categories of Systemic Lessons of: Resourcing, Schedule Management, Requirements Management, and First of Type Equipment.

No further comments are deemed necessary as a result of the 2009-10 MPR.
The project is still assessed as being six years late, but the DMO Project Maturity Score is a perfect 100%!

NEXT GENERATION SATCOM
(2009-10 Major Projects Report)

General

This project started well, as it was done in partnership with a US program. However, difficulties have now arisen in relation to the ADF's access to satellite communications technology and matters associated with mutual liability and disclosure of information.

The project struck significant delay when engineering, test and certification tasks were encountered, relating to:

- ***Managing the program within the constraints defined in the Joint Production Operations and Support Memorandum of Understanding that Defence has entered into.***
- ***The risk shared by the Commonwealth for satellite failures and schedule overruns.***
- ***Management of the technical and commercial complexities to ensure necessay insight into the WGS program.***
- ***The development of project management documentation.***
- ***Management of the engineering and testing required for WGS certification.***

In general, this project demonstrates the difficulties that arise when firm project and engineering baselines have not been established before contract committal. It is a good example of the adage that 'it is far better to stay out of trouble than get out of it'.

Lessons Learned

These relate to:

- ***Ensuring local SME Companies do not underestimate the technical and resource requirements of a project.***
- ***The need for strengthening the governance process.***

While given Categories of Systemic Lessons of Resourcing and Governance, both fall into simple project planning tasks under project management procedures.

At present, the project is assessed as having a risk consequence of Major with the potential to become Severe/Catastrophic.

OVERLANDER VEHICLES AND TRAILERS
(2009-10 Major Projects Report)

General

The critical design baselines for the various LLC (Light Vehicle) configurations are progressing, with delays of one to 13 months. No baseline has been established for the MHC (Heavy Vehicles) at this stage. The Readiness Reviews and Functional Configuration Audits are also showing delays of up to 13 months. Despite this, the IOC and FOC are unchanged. These areas are covered in the Major Project Risks. These risks state that 'the MHC Initial Operational Capability required by the Acquisition Agreement has been affected by the MHC resubmission activity process leading to an impact on schedule'.

Lessons Learned

These identify:

- ***Costly and time consuming Contract Change Proposals due to requirements variations.***
- ***The time required to negotiate contracts for the project.***
- ***Pressures to compress the Schedule require key decisions to be taken to achieve the aim.***

While each of these comes under project management, they have been given Category of Systemic Lessons of: Contract Management, Schedule Management and Resourcing.

In regard to the problems of changes in requirements and the resulting costly and time consuming Contract Change Proposals CCPs), such changes have to be scoped under standard project engineering procedures before contract changes can be identified, but they seem to be coming solely under contract management processes, with unsurprising consequences.

This project will encounter many challenges that will require a level of sound and tightly integrated operational, project and engineering management that appears not to exist.

The project is reported to be on schedule, but achieving full capabilities on schedule will present considerable challenges.

The report gives this project a 100% green 'Traffic Light', which seems optimistic at this stage.

ANZAC SHIP MISSILE DEFENCE 2B
(2009-10 Major Projects Report)

General

This project has encountered major problems, all indicative of DMO's entrenched difficulties in the management of projects having any degree of complexity, especially where system integration is involved. Considerable delay has resulted from difficulties arising from decisions surrounding the choice of the Phased Array Radar. This may have been avoided had a robust engineering evaluation and risk analysis of this system been conducted.

Lessons Learned

These relate to:

- ***Technically complex and risky developmental projects, especially with integration requirements, require a prototype to be developed for proving the capability before acceptance.***
- ***Adequate communications between those involved is needed to ensure that a common understanding of project status is maintained.***

While both lessons both go the heart of Systems and Project Engineering Management, they have been given Categories of Systemic Lessons of First of Type Equipment and Governance.

Capability Status

Major capability risks still face this project, but DMO"s Measures of Effectiveness is scored at 100%.

While this project has been reduced from an eight ship program to a single ship program, the IOC is 18 months late and the FOC over four years late, meaning that it has a Risk Consequence of Severe/Catastrophic.

FOLLOW-ON STAND OFF WEAPON
(2009-10 Major Projects Report)

General

This project is now two years late and still has to overcome risks associated with:

- ***The ability to conduct OT & E in Australia.***
- ***Certification being affected by not meeting airworthiness requirements.***
- ***Failure to achieve acceptable capabilities.***
- ***Integration into the Hercules.***
- ***Non or partial release of USN/USAF data.***

Lessons Learned

- ***These relate to Integration complexity due to interfaces in ageing platforms.***
- ***Incorrect Interface Control Documents.***
- ***Host platform upgrades required.***
- ***Inadequate project staff.***
- ***Problems when the US capability is still being developed, while Australia is the the integrator.***

These all identify inadequate or absent project and engineering management. However, DMO sees them as arising from First of Type Equipment (3), Requirements Management (1), and Resourcing (1).

The project IOC and FOC are both two years late, which gives a Risk Consequence of Severe/Catastrophic. DMO, however, gives itself a Measures of Effectiveness Score of 100%!

ANZAC ANTI-SHIP MISSILE DEFENCE 2A
(2009-10 Major Projects Report)

General

Major risks and issues being encountered include:

- ***The radar may not meet performance requirements.***
- ***Operational requirements may not be achieved.***
- ***The system supplied may reach obsolescence before additional ships are modified.***
- ***Technical problems have delayed factory testing for six months.***

Lessons Learned

These identify:

- ***"Adequate implementation of Project Systems Engineering processes. In light of this, the ASMD Project has rigidly followed a disciplined systems engineering process that has ensured the complete traceability from requirements through to final acceptance testing".***
- ***"Ensuring that Stakeholder engagement at all levels (Engineering and strategic) is culturally embedded within the Project Team."***

These have been given a Systemic Lesson Category of 'Requirements Management' and 'Contract Management', with no mention of project/engineering management as a lesson category. The 'rigid and disciplined systems engineering process promised by DMO are merely words without substance and will never eventuate under current contract-centric management processes. The need is for professional project/engineering management, not contract administrative process.

Capability Status

The IOC for this project is now 39 months late and the FOC 64 months late. The project has thus been at a Risk Consequence of Severe/Catastrophic for over three years. However, DMO gives it a Project Maturity Score of 55 against a benchmark of 55, and a Measure of Effectiveness of 100%!

COLLINS CLASS SUBMARINE
RELIABILITY AND SUSTAINABILITY
(2009-10 Major Projects Report)

General

The deficiencies in Collins boat capability, reliability and sustainment did not arise overnight, but have accumulated over more than a decade. The central question is why they were seemingly not identified, qualified and quantified under a disciplined Defect and Failure Reporting System and made the subject of a planned rectification programme, tightly coordinated with operational plans – the manner in which naval systems were managed when Navy possessed a Chief of Naval Technical Services?

The current situation confirms, very expensively, that the Defence Reform Program and the Commercial Support Program have left Navy without the engineering and maintenance skills and competencies required to operate and sustain its maritime capabilities. It also confirms the failure of the Australian Submarine Corporation's Through-Life Support Agreement to provide timely, efficient and effective support of one of Australia's primary military capabilities. It also raises serious concerns that similar support contracts being entered into by DMO have the potential to go the same way under current Defence/DMO management.

Project Context

This notes that in 1999 Government sponsored the 'McIntosh and Prescott Report' into submarine capability, which was followed by a review by the Head, Submarine Capability Team. Given the parlous situation that developed unchecked over the following decade, this Government, Defence, and DMO approach must be assessed as a serious failure.

The scope of work under this project covers 24 system upgrades, two of which will be new capabilities, the remaining 22 being engineering 'enhancements'. Such a challenge would suggest that a robust project and engineering management approach was required, whereas the project proceeded under the DMO's usual contract centric approach - with the usual results.

Lessons Learned
These identified:

- ***A lack of clarity of capability requirements and proper funding before planning started.***
- ***A lack of submarine maintenance schedule coordination with the project.***
- ***Problems with long-term, sole-source, cost-plus contracts.***

These in turn have been given Categories of Systemic Lessons of Requirements Management, Schedule Management, and Contract Management. In fact, all fall within the role and function of Project Management.

Capability Planning

The IOC for this project is currently 14 months late and the FOC 8 ½ years late, meaning that the Risk Consequence for the project (if FOC is achieved as planned) will have been Severe/Catastrophic for 6 ½ years. Despite this, DMO has awarded itself a Measure of Effectiveness of 100%!

The project can be classed only as an expensive failure with horrendous consequences for Navy as well as Australia's security and international reputation.

REPLACEMENT HEAVYWEIGHT TORPEDO
(2009-10 Major Projects Report

General

This project reports a three month delay in IOC and a two month delay in FOC depending upon obtaining timely response from external agencies

Lessons Learned

These point to:

- ***A lack of adequate staffing at project commencement.***
- ***All project dependencies should be established before the Schedule is established.***
- ***Identify Technical Data and technology requirements are identified early to ensure deliver in time.***
- ***Joint development projects introduce introduce project management, cost, technology and schedule risk.***

DMO allocates these to the Systemic Category Lessons of Resourcing, Schedule Management, Requirements Management, and First of Type Equipment. , whereas all come under the umbrella of Project Management, which was clearly missing.

History

This project status should be read in conjunction with ANAO's Lightweight Torpedo Replacement Report No 37, 2008-09, which found:

- ***"Initial costing of Phase 2 of the JP2070 was not sufficiently rigorous or subject to adequate scrutiny.***
- ***Project planning and management was inadequate, and in some instances key documents were either not developed or were not developed on a timely basis.***
- ***The decision to use alliance contracting arrangements... was not based on structured analysis of contractual options, and once implemented was not adequately supported.***
- ***An inadequate understanding of the weapon and its developmental status ...contributed to an underestimation of project risk.***
- ***The risk involved in integrating the weapon into multiple platforms was acknowledged, but not fully appreciated at the outset. The cost to integrate was underestimated significantly.***
- ***The planning of testing and acceptance, and the resolution of testing and acceptance issues ...has been inadequate."***

All of these are symptomatic of a lack of core skills and competencies in project and engineering management, and the use of contract-centric processes as the primary management vehicle.

PROJECT RISK CONSEQUENCES

ATTACHMENT 1 TO ANNEX C

(BASED UPON DMO MPR 2008-09, UPDATED TO REFLECT DMO MPR 2009-10)

As with other Australian and International Standards, DMO has re-invented those Standards relating to risk. For example, the Australian and International Standards define the highest level of consequence as '***Catastrophic***', while DMO defines it, euphemistically, as '***Severe***'. At this risk level, the consequences are defined by DMO as:

- Causing loss of life,
- Supplies functionally unfit for their intended purpose.
- Supplies are unsupportable.
- Defence attracts media attention, or a commission of inquiry is launched.
- Would cause the specified in-service date (of the IOC) to be missed by more than twelve months.
- Would cause the in-service date for the FOC to be missed by two or more years.
- Would cause the total actual contract costs, taking into account liabilities incurred by the Commonwealth, to exceed currently approved cost provisions by >10%.

DMO then defines the next highest level of consequence is defined by DMO as '***Major***', the consequences being as follows:

- Would cause serious casualties resulting in the long-term physical impairment of personnel.
- Would cause the supplies to be only partly functionally fit for purpose (i.e. degraded ability to perform some core missions or essential tasks or unable to perform non-core missions or tasks, and there are no known workarounds).
- Would cause the supplies to be unsupportable in low-tempo operations or for short periods of time due to a deficiency in a fundamental input to capability. There are no known workarounds.
- Defence attracts adverse media attention or an investigation is launched.
- Would cause the specified in-service date to be missed by 6 – 12 months.
- Would cause the date for full operational capability to be missed by between one and two years.
- Would cause the total actual contract costs, taking into account liabilities incurred by the Commonwealth, to exceed currently approved cost provisions by 5-10%.

The inclusion of media criticism as a risk consequence leaves the whole risk management process open to bureaucratic distortion/misinformation on the grounds that the truth may 'damage' the Department's reputation. For example, the manner in which late/over-costly/ capability deficient projects might be managed.

Within both Major Projects Reports to date, no reference is made to any actual risk levels and consequences in accordance with any Risk Standard.

PROJECT	TYPE OF CONTRACT	FORM OF CONTRACT	IOC PLANNED	IOC CURRENT	FOC PLANNED	FOC CURRENT	COMMENTS
AIR WARFARE DESTROYER - 3 AWDs + SUPPORT SYSTEMS - PLATFORM DESIGN - 3 AEGIS SYSTEMS	VARIABLE (Pain/Gain Share) FIXED (With Ind Escalation) FMS	ALLIANCE ALLIANCE BASED FMS	JUN 16	JUN 16	DEC 18	DEC 18	Currently shown as on schedule, but carries risks potentially at ***Severe/Catastrophic*** level.
BRIDGING AIR COMBAT CAPABILITY	FMS	FMS	DEC 10	DEC 10	DEC 12	DEC 12	Currently shown as on schedule, but see PDS analysis for potential operational risks
MULTI ROLE HELICOPTER	VARIABLE	ASDEFCON (Strategic)	JUL 10 (N) APR 11 (A)	JUL 10 (N) OCT 11 (A)	DEC 12 (N) JUL 14 (A)	DEC 12 (N) JUL 14 (A)	Army version currently 6 months late. Potential risks assessed at ***Severe/Catastrophic*** level**.**
AEW&C	VARIABLE	DEFPUR 101	DEC 07	DEC 11	DEC 08	DEC 12	4 Years late currently Risk consequence now ***Severe/Catastrophic***
AMPHIBIOUS CAPABILITY	VARIABLE	ASDEFCON	JUN 15 NOV 16	JUN 15 NOV 16	NOV 16	NOV 16	Currently shown as on schedule, but inherent risks assessed at ***Major***, approaching ***Severe/Catastrophic*****.**
ARMED RECCE HELICOPTER	VARIABLE	SMART 2000	JUN 07	SEP 09	JUN 09	DEC 12	IOC currently 27 and FOC 42 months late. Risk consequence now ***Severe/Catastrophic***.
AIR TO AIR REFUELLING	VARIABLE	AUSDEFCON	DEC 09	Late 2010/ Early 2011 ***JUN 11***	MAR 11	LATE 2012 ***DEC 12***	IOC currently 12 and FOC 18 months late. Risk consequence now ***Major, approaching Severe/Catastrophic***.

C-17 GLOBEMASTER	FMS	FMS	AUG 07	SEP 07	DEC 11	JAN 11	FOC currently 11 months late. Risk consequence now ***Major***.
HORNET UPGRADE	FIRM/FIXED (5) TIME & MATERIALS & FIRM/FIXED (1)	DEFPUR 101 FMS ASDEFCON MIXED	APR 07 NOV 09	APR 07 NOV 09	DEC 07 AUG 11	DEC 07 AUG 11	Currently shown as on schedule, but see PDS analysis for risks.
GUIDED MISSILE FRIGATE	VARIABLE	DEFPUR 101	MAY 03 JAN 04 JUL 04 JAN 05	APR 09 APR 09 APR 09 AUG 09	JUL 04 DEC 04 JUN 05 DEC 05	DEC 09 DEC 09 DEC 09 DEC 09	IOC late by 55 to 71 months and FOC late by 48 to 65 months. This project proceeded for many years with a risk consequence of ***Severe/Catastrophic***.
HORNET STRUCTURAL	FIXED PRICE/TIME & MATERIALS (2) TIME & MATERIALS (2) FMS	ASDEFCON (3) DEFPUR (Hybrid) FMS	N/A	N/A	N/A	N/A	See comments at PDS analysis for potential fatigue risks.
BUSHMASTER	VARIABLE	DEFPUR 101	N/A JUL 07 JUL 08 OCT 11	DEC 04 MAR 08 NOV 08 OCT 11	OCT 07 APR 09 APR 12	DEC 09 APR 10 APR 12 ***NOV 10 (PP 1)*** ***NOV 10 (PP 2)***	IOC up to 8 months late. FOC up to 26 months late, which gives a risk consequence of ***Severe/Catastrophic***. ***FOC now 37 months late***
HF MODERNISATION	VARIABLE	DEFPUR 101 v46	MAY 04 ***NOV 04 (Part)*** ***MAY 04***	JUL 10 ***NOV 04 (Part)*** ***OCT 09***	MAY 05 MAY 05 ***MAY 05***	JUL 11 2016 ***MAY 15***	On current estimates, IOC 74 months late, and FOC 74 and 127 months late, giving a risk consequence of ***Severe/Catastrophic. FOC now 10 yrs late.***

ARMIDALE CLASS BOAT	VARIABLE	SMART 2000/ ASDEFCON	N/A	N/A	MAR 09	DEC 11 ***MAR 12***	FOC currently 33 months late, giving a risk consequence of **Severe/Catastrophic.** ***FOC now 3 yrs late.***
COLLINS COMBAT SYSTEM	VARIABLE (4) FIRM PRICE (5) FIXED (6)	AUSDEFCOM (Strategic) (4) (Complex) (6) (Services) (1) FMS (3) Army Co-op Proj (1)	MAR 08	MAY 08	2010	2016	FOC currently 72 months late, so has been at a risk consequence of ***Severe/Catastrophic*** for many years. The operational capability being provided will remain questionable over the life of the Collins Class boats.
OVERLANDER VEHICLES	VARIABLE (4)	AUSDEFCON	DEC 13	DEC 13	DEC 19	DEC 19	Currently assessed as being on schedule, but full capabilities will present considerable challenges.
NEXT GENERATION SATCOM	FIRM FIXED (2)	MOU AGREEMENT AUSDEFCON (Complex)	AUG 08 NOV 08	JUN 08 JUN 08	DEC 14 JUL 09	DEC 14 OCT 10	FOC is 15 months late which gives a Risk Consequence of ***Major***, with the potential to become ***Severe/Catastrophic.***
ANZAC ATI-SHIP MISSILE DEFENCE 2B	VARIABLE (2)	ALLIANCE AUSDEFCON	DEC 09	JUN 11	MAR 13	APR 17	IOC is 18 months and FOC 49 months late, so has been at a Risk Consequence level of ***Severe/Catastrophic*** for many years.
REPLACEMENT HEAVY WEIGHT TORPEDO	FIXED (2)	MOU AGREEMENT (2)	FEB 08 NOV 12	MAY 08 NOV 12	JAN 10 NOV 13	MAR 10 NOV 13	IOC is 2 months and FOC 2 months late. Project still faces risks.

COLLINS CLASS SUB -	VARIABLE (COST PLUS)	STRATEGIC AGREEMENT	NOV 10 AUG 10 OCT 13 AUG06	NOV 10 AUG 10 OCT 13 OCT 07	JUN 07 JUN 14 JUN 14 JUN 14 JUL 06	DEC 15 OCT 13 SEP 22 MAR 17 NOV 07	IOC is 14 months late for one item. FOC delays vary from 16 to 102 months, which means that the project has been at a Risk Consequence Level of ***Severe/Catastrophic*** for 6 ½ years.
FOLLOW-ON STANDOFF WEAPON	FMS (2) FIRM FIXED	FMS (2) DCS	DEC 09	DEC 11	DEC 10	DEC 12	Both the IOC and FOC have been delayed for 24 months, which means that the project is now at a Risk Consequence Level of ***Severe/Catastrophic***.
ANZAC SHIP MISSILE DEFENCE 2A	VARIABLE	ALLIANCE AUSDEFCON	MAR 08	JUN 11	DEC 11	APR 17	IOC is 39 months and FOC 64 months late, which means that the project has been at a Risk Consequence Level of ***Severe/Catastrophic*** for nearly 3 ½ years.