Senate Standing Committees on Economics
Inquiry into the Future of Australia's naval ship building industry.

Submission to the Senate Economics References Committee on Part 1 of the terms of reference Inquiry into the Future of Australia's naval ship building industry

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Submission made by:
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Introduction

"No responsible government could consider providing further work to an industry that is performing so poorly," Senator Johnston said

Clearly the Government and DMO have lost TRUST in the Australian ship-building industry and believe they are not up to building these new ships for the Navy.

And who can really blame them ?

The Australian ship-building industry has a long and sad history of poor performance in Defence weapons acquisition programs with the recent example of the latest ANOA report labeling the AWD program a "disaster" with very large cost and time blowouts that will have a profound impact on future warfighter capability.

But there are new methods available that can dramatically improve local ship-building performances.

***Part I of the inquiry**: The tender process for the Royal Australian Navy's new supply ships, and given the significant impact that this decision will have on the Australian shipbuilding industry, in particular:*

a. *The reasons for the Government's decision in June 2014 to exclude Australian-based defence industry from tendering for the replacement of HMAS Success and HMAS Sirius, and instead have a restricted tender for Spanish and South Korean shipbuilders.*

With a very short timeline for delivery of the new ships in operational condition the Government has considered that the Australian ship-building industry cannot deliver the ships in the required timeline.

Given recent events with the AWD program and the current problems with the commissioning of the first LHD ship such a decision seems logical in the circumstances.

Ultimate responsibility for this decision can largely be sheeted home to the ship-building contractors – and their lack of seeking out better practices and methodologies that would overcome their difficulties with current programs.

There are new best practice methodologies in defence acquisition that are available around the world - but these are not used by the Australian ship-building industry.

SEE APPENDIX B: A Red Team approach to Defence Procurement

b. *The capacity of Australian shipbuilding to carry out, in part or in full, the construction and fit-out of two auxiliary ships to replace the Navy's HMAS Success and HMAS Sirius.*

Given their lack of urgency to find and adopt these new best practice methodologies – then the Australian ship-building industry can only be judged by what they are doing now – clinging to old methodologies and prior best practice methodologies that have failed them again, and again, which has resulted in their poor past performance – and which have delivered compromised development programs and warfighter outcomes.

Without the adoption of new best practice methodologies that will overcome their current handicap it would seem there is little scope for the local ship-builders to meet the time constraints in this program.

c. *The role of the Department of Finance and/or Department of Treasury and/or Department of Defence, the Finance Minister and/or the Treasurer and/or the Defence Minister, in the Government's decision to exclude Australian defence industry from tendering for the auxiliary ship replacement project.*

I have no Comment on this topic.

d. *The feasibility of including Australian industry participants in the tender process for the replacement auxiliary ships.*

Any possible involvement by Australian ship-building must be decided based solely on their willingness to adopt better development methodologies already in place in the commercial and defence acquisition worlds.

If they cling to their current antiquated methodologies, then logically they should not be entitled to be involved in this tender process.

e. *The management and performance of the Defence Materiel Organisation (DMO) that contributed to the Government's decision to exclude Australian industry from tendering for the replacement auxiliary ships.*

Around 2010 the then Government reforms of DMO made the program managers "personally responsible" for the poor performance of their weapons system acquisition programs.

This has resulted in a severe "risk averse" culture developing in DMO.

With local developed programs being seen as the highest risk, (and therefore to be avoided at any cost)

While MOTS and COTS programs are the lowest possible risk.

Hence today DMO prefers MOTS or COTS programs (lowest of all possible risk)

f. Any related matters.

In truth the real problem is with the DMO's Defence Weapons systems acquisition methodology that is in use today. (which is itself based on Kinnaird outcomes which is based on industry best practice from the 1990's.)

In truth the AWD ship itself is not faulty – it is simply a "perfect outcome" of the faulty program development methodology used to develop the AWD. (by the same logic, Collins submarine is also a perfect outcome of the system used to develop it) (same could be said for most of the "projects of concern" in recent years)

That is, the AWD ships are faulty because the program management system and development methodology used to develop them is broken. **(a "broken" development system will always deliver "broken" outcomes)**

Another way of looking at this is, that a much better program management methodology will deliver much better built locally built ships. **(a robust development system will always deliver robust outcomes)**

If we want better local Australian produced outcomes we must first change the way we develop them.

SEE APPENDIX A: the AWD A$1Billion disaster

The future of Australian ship-building in both a Defence and Commercial sense will be decided by the customer.

If the Australian ship-building industry does not reform its development methodologies to prevent future "projects of concern' with resultant blowouts in cost, time and performance outcomes – then it is logical that the customer (in this case the Government) will decide to use a supply chain that does use better methodologies and achieve better cost, time and development outcomes.

The pressure on decisions by DMO to support MOTS and COTS over local ship-building will only ever increase with time if the Australian ship-building industry continues to perform badly.

If Australian ship-building is to survive – then both DMO and the ship-builders must reform their program development methodologies.

Personally I don't hold out much hope of this happening.

Today, Defence is on my Not-To-Do list.

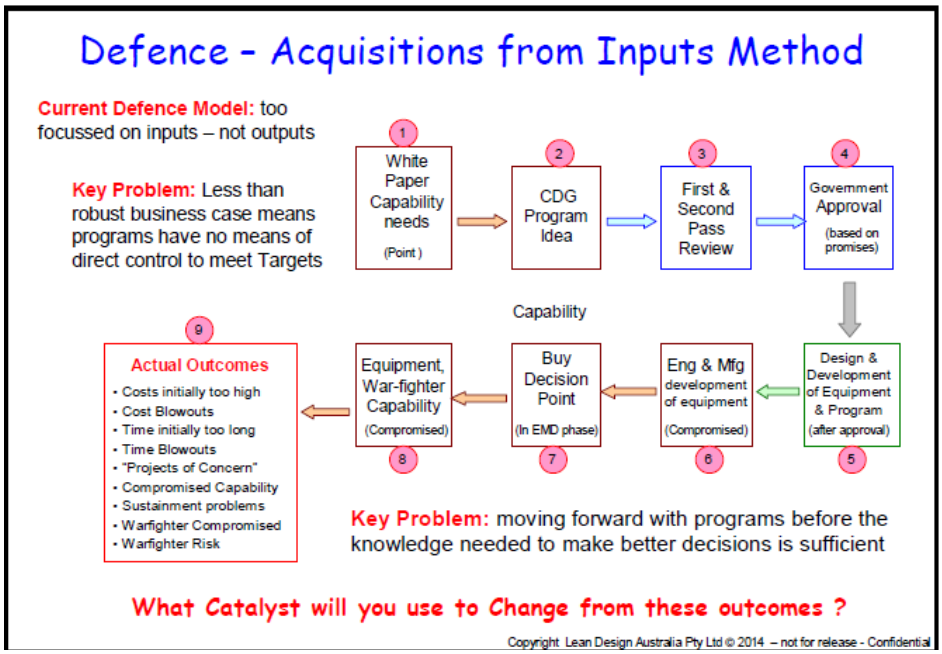
In the past 4 years of my time in Defence this problem has grown to the point that has finally resulted in the decision to exclude Australian ship-building from this, and probably future weapons acquisition programs.

I have seen little interest from anyone in Government, Defence, DMO or the local ship-building industry to resolve the underlying problems that have led directly to this outcome.

Perhaps this Senate committee will open this Pandora's box and finally begin the reform process.

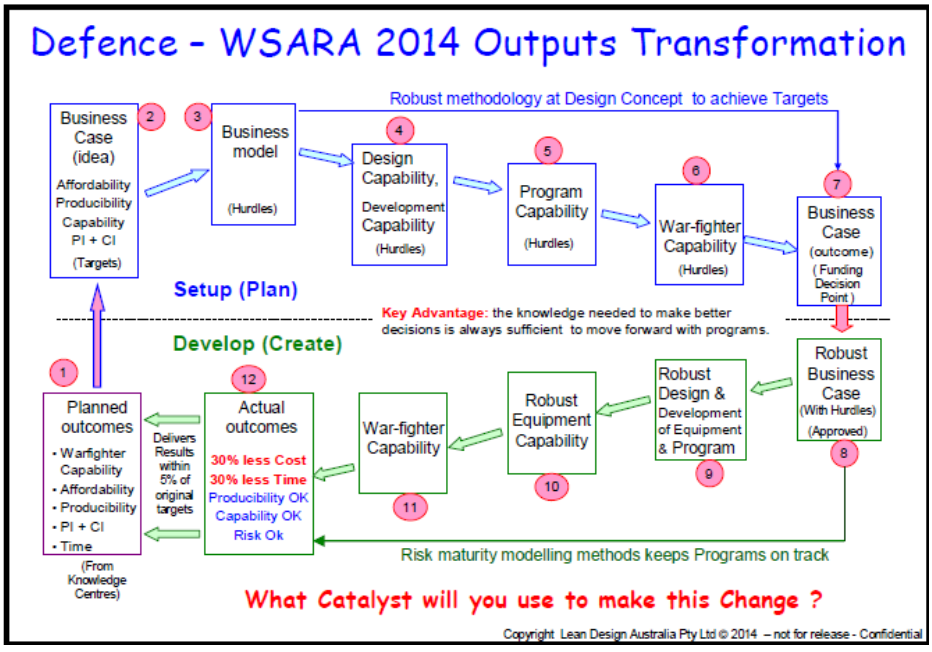
A change of thinking about how to develop future weapons acquisition programs.

The current DMO program development methodologies are described in the graphic below.



The new world's best practice program development methodologies (below) now focus on outcomes rather than inputs as in the old way (above)

By focusing on outcomes first – we are able to much better design the business case and business model – and then develop the design, program and warfighter capability needed from the program with time, producibility and cost outcomes that will actually deliver the desired outcomes to the meet the original targets.



"…in truth this new frontier for weapons systems will deliver far better capability to the warfighter … simply because Cost, Time, and Producibility can be entirely eliminated as limiting factors in all acquisitions …"

Typically this new methodology can deliver quite astounding improvements in Defence weapons acquisition programs and can virtually eradicate the typical cost, time and producibility blowouts that we experience in Australian ship-building and other Defence "projects of concern".

WSARA 2014 Target + Hurdle System

- ***Design for Cost - Target Cost – 5 to 50%*** ↓
- ***Design for Time – Target Time – 10 to 40%*** ↓
- ***Design for Quality – 40 to 90% Improvement*** ↑
- ***Design for Simplicity – 50-80% Improvement*** ↑
- ***Design for Producibility – >90% Improvement*** ↑
- ***Design for Risk maturity - >95% Improvement*** ↑
- ***Design for Confidence - >95% Improvement*** ↑

SEE APPENDIX B: A Red Team approach to Defence Procurement

Appendix A: the AWD A$1Billion disaster

From: Gary Stewart
Sent: Friday, 7 March 2014 11:07 AM
Subject: FW: the AWD $1Billion "disaster" - no-one is listening to a new approach to Defence Procurement: Acquisition and Sustainment - or how to save $10billion on SEA 1000 and other Defence programs - or how to prevent more debacles like AWD

With the AWD program now officially proclaimed (ANAO) a debacle (read disaster) with a (current) $1Billion cost penalty and $300m cost blowout and 2 years late – I want to ask why Defence has for the past 4 years, completely and utterly ignored a new commercial solution to prevent these types of disasters.

The same can be said for our past and current Governments who have completely and utterly ignored a potential solution staring them straight in the face.

For the past four years I have endeavoured to get SOMEONE, ANYONE, interested in a program that eliminates disasters like the AWD debacle.

In that time no-one has ever asked one question to verify the efficacy of this new program.

No-one

Not one question!

Not Defence

DMO – no-one
CDG – No-one
DoD – no-one

Not the Ministers

Smith – no-one
Clare – no-one
Johnston – no-one
Robert – no-one

Not Finance or Treasury (despite $1Billion blowouts)

Finance – no-one
Treasury – no-one

Not the Primes

ASC – no-one
AWD Alliance - no-one

Now with AWD declared an "official" $1Billion disaster – still no-one is listening.

WHY??

What is it about Defence that no-one cares enough to actually do something different?

Why is Defence allowed to keep making the same mistakes over and over again?

Why is nothing ever actually done about this ongoing problem? (holding "desk reviews" is not DOING)

When will SOMEONE, ANYONE, actually decide to DO something about these never-ending debacles?

I can completely understand that people buried in the current Defence way of thinking can believe that a new program that can eliminate these disasters is not possible.

I can even understand they might even think it must all be marketing "bull-sh*t" to be able to deliver 30% lower costs, better producibility outcomes, in shorter timelines.

What I can't understand is that NO-ONE even asks one question?

No-one

Not one Question !!

Ever !!

(see below if you need clarification)

Regards

Gary D Stewart
Managing Director
Lean Design Australia Pty Ltd

From: Gary Stewart
Subject: A Red Team approach to Defence Procurement: Acquisition and Sustainment - or how to save $10billion on SEA 1000

..... I had to suppress a chuckle.

You see I have been trying for many years now to get someone, anyone, from Defence interested in a new industry best practice program that will eliminate precisely the types of problems experienced on the AWD program

But the AWD problem is itself merely a symptom of a much wider issue of continuing competency involved in program management of the whole Defence Weapons Acquisition methodology that currently results in Cost, Time and Producibility blowouts.

(otherwise known as "projects of Concern") (Hawkeye is the next cab off the rank as a "project of concern" - over weight and over cost - perhaps the ANAO can call it a debacle too)

Instead of fixing the core problem - we have more reviews - The Government has as you know commissioned a - "Review of the AWD program".

The problem with most these reviews are that they are mostly "desk reviews" - a review undertaken largely in meeting rooms talking to higher level people.

For example- Collins which has already suffered 5 "desk reviews" - yet no physical in submarine "hands-on reviews" have ever been performed - fixing of actual problems is hard because we are not looking at the detail level - which is where the program goes wrong.

Unfortunately I think this is more of the - "our systems are not broken - we just need to improve what we have" thinking from the DMO.

The real failure is that the DMO will not move on from the "Kinnaird" outcomes (modified by Mortimer) that were based on industry best practice from the mid-1990's.

In the intervening 20 years technology and industry best practice has moved on enormously - but Australia is now lagging a very long way behind.

The new frontier for weapons procurement

I have attached a series of documents that I have submitted to the Defence Minister based on a new methodology for Defence Procurement in Australia, that will completely eliminate the type of problems raised in the AWD program and the subject of the review.

It is based on new work out of the USA - and would have very profound impact upon all future Defence acquisitions in Australia. (its main aim is to prevent any form of repeat of the JSF type program cost, time and functionality blowouts)

As you can see in the titles - "how to save $10b on SEA 1000" (new submarine) that far better Affordability of defence equipment is one its key goals - Producibility and Timeliness are the other major goals .

Typical results using this methodology suggest that very large cost reductions and very substantial improvements in Producibility and Sustainment outcomes and ultimately better warfighter capability can be achieved.

" …in truth this new frontier method for weapons systems acquisition will deliver far better capability to the warfighter … simply because Cost, Time, and Producibility can be entirely eliminated as limiting factors in all future acquisitions …"

The key to making this work is that this methodology focuses upon that delivers defined program outcomes - rather than controlling program inputs as existing government programs do - which will always result in limited or dubious outcomes.

The 3 documents in total;

1. A 2-page executive overview 2. A visual PowerPoint presentation version 3. The full document

I suggest first reading only the overview and the PowerPoint version to get the gist of the idea.

FYI - Over the past few years I have also spoken to;
Warren King, CEO DMO
David Gould GM Submarines
RADM Greg Sammut - Head Future Submarine Program - DMO
CAPT Stephen Dalton - Program Director Submarines - *CDG*
CDRE Rob Elliott - Director General Maritime Development – *CDG*
RADM Rowan Moffitt - former Head Future Submarine
Mr Brendan Sargeant - Deputy Secretary Strategy – Department of Defence
Mr Stephen Ludlam - CEO ASC Pty Ltd
All except Warren King have seen these documents - he has only had it explained verbally

My original aim in this paper is because I think that without the Minister demanding change - then change like I believe is possible will never happen within the DMO.

The result will be ever ongoing "projects of Concern" and Cost blowouts when cost reductions of 30%, time reductions of 20%, and producibility improvements of 60-80% can easily be achieved.

Regards

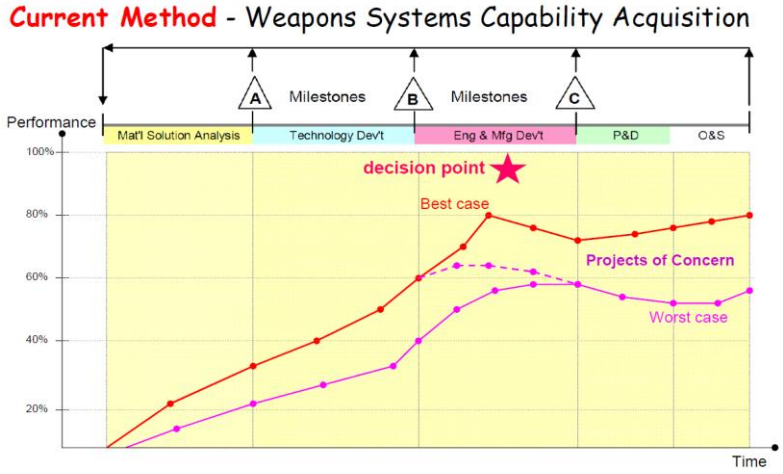
Gary D Stewart
Managing Director
Lean Design Australia Pty Ltd

Appendix B: Executive Overview - A **Red Team** approach to Defence Procurement: Acquisition Improvement and Sustainment. (or how to save $10b in Cost in SEA 1000)

Defence Weapon Systems acquisitions have been on the high risk list for many years – simply because despite efforts at acquisition reform since the Collins program, far too many current acquisition programs still experience cost overruns, schedule delays, and capability and performance shortfalls.

These cost overruns, missed deadlines and failed programs are symptoms, not root causes.
Unless the root causes are addressed, no amount of additional oversight, extra regulation, rearranging of organisation boxes, creation of new offices, senate hearings, or changes to processes will help future programs. In fact they will most likely make things worse.

All of these past problems in acquisition programs share a common dynamic: - moving forward with programs before the knowledge needed to make better decisions is sufficient. Yet constrained future budgets will demand a culture of better decision making across all future acquisition programs.



Current acquisition methodology sees the final decision point for acquisition occur about midway through the engineering & manufacturing development stage of the program development, with target MRL & TRL of 6 (60%) being achieved at the Milestone B target.

This final decision point is based on "should-cost" from here estimates, and "should-be-capability" and producibility predictions as the program nears milestone C (Production).

But the results being achieved in many current and past programs show that typically weapons acquisition programs do not ever achieve this "best-case" performance level, and more typically follow the "worst-case" line, or fall somewhere in-between.

Additionally many programs, even those at "best case" will suffer many producibility problems, capability shortfalls, cost overruns, time delays and will become "projects-of-concern" which must then be remediated as best they can be, given the difficulty of recovering the program so late in the design and development of the total program.

All of this presents something of a major dilemma for the Government. Today in times of austerity the government must husband every available dollar and put it to its most efficient use. It can no longer afford, nor tolerate, a defence acquisition system that is seen as costly, overly-complex, and slow to respond to an ever-changing world or that results in massive cost overruns and long program delays.

Improving Defence Weapons Acquisition best practice (WSARA2009)
WSARA2009 (Weapons System Acquisition Reform Act 2009)

In the USA, GAO and Defense Acquisition University studies of weapons acquisition programs indicate that more than 85% of both the acquisition and total lifecycle cost of a weapons system program is determined and already locked-in by the time the first requirements are finalised - before milestone B.

As a result, the USA has enacted the Weapons System Acquisition Reform Act 2009 to overcome these deficiencies. This has mandated a change in US Defence Acquisition processes to provide a far more robust and methodological decision making framework, far earlier in the development cycle. This requires the DOD to conduct a root cause analysis of the cost, schedule and performance for all weapons acquisition systems using realistic cost estimating, prototyping, and systems engineering practices that will in turn confirm that their technologies are mature, their designs stable, their production processes are in control, which will result that the desired capability will be delivered to the war-fighter.

However development did not stop there, and in the intervening 5 years OSD (Office SecDef) and its partners have added a vast amount of research, new ideas, new functionality, additional features and risk maturity modeling far above and beyond the capability of the WSARA2009 legislated program.

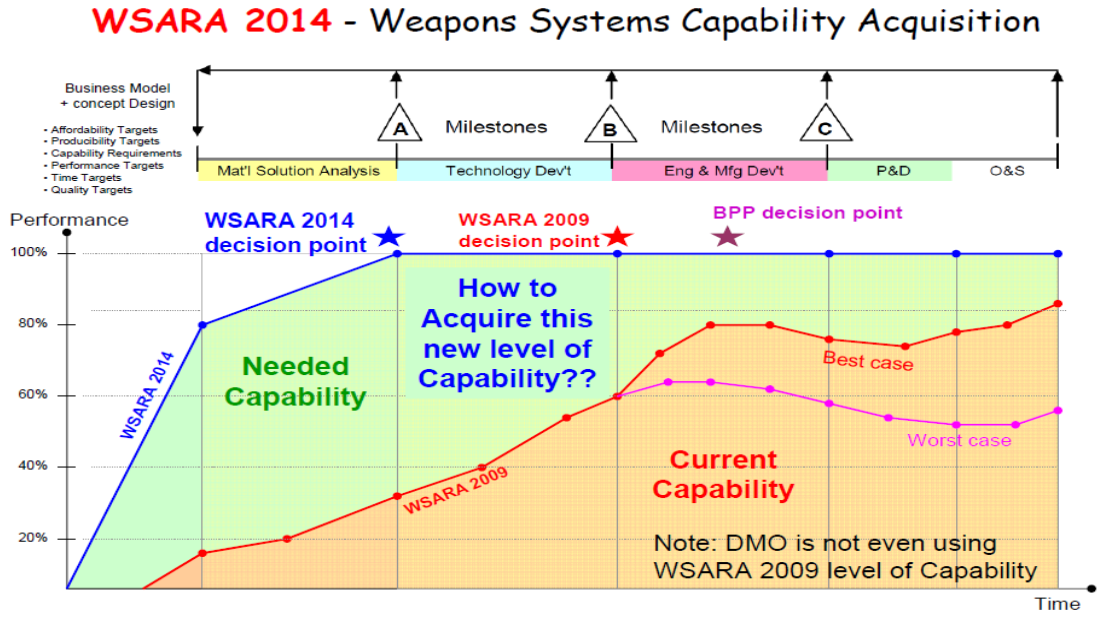
At the same time a commercial world evidence based industry best practice program based on the same thinking has determined that it is the Initial Concept Design that creates up to 90% of all program cost structures & cost problems, with all Time delays and Quality and performance problems flowing from this point. This suggests that cost and producibility outcomes are in fact locked-in before Milestone A.

Improving industry best practice Acquisition from OSD and Commercial world (WSARA2014)
WSARA2014 (Weapons System Acquisition Reform Act 2014)

This new Frontier Defence based program now updated to the much higher performance WSARA2014 level has developed a very robust Affordability and Producibility modeling methodology, with a highly evolved Risk maturity modeling capability, which consistently delivers 30% lower cost outcomes, while delivering far better performance, operational and warfighter outcomes.

"...in truth this new frontier for weapons systems will deliver far better capability to the warfighter ... simply because Cost, Time, and Producibility can be entirely eliminated as limiting factors in all acquisitions ..."

Its aim - eliminate any repeat of the JSF (or Collins, or AWD) programs cost, time, performance or capability debacles.



The difference in thinking and methodology are made immediately clear in this graphic.

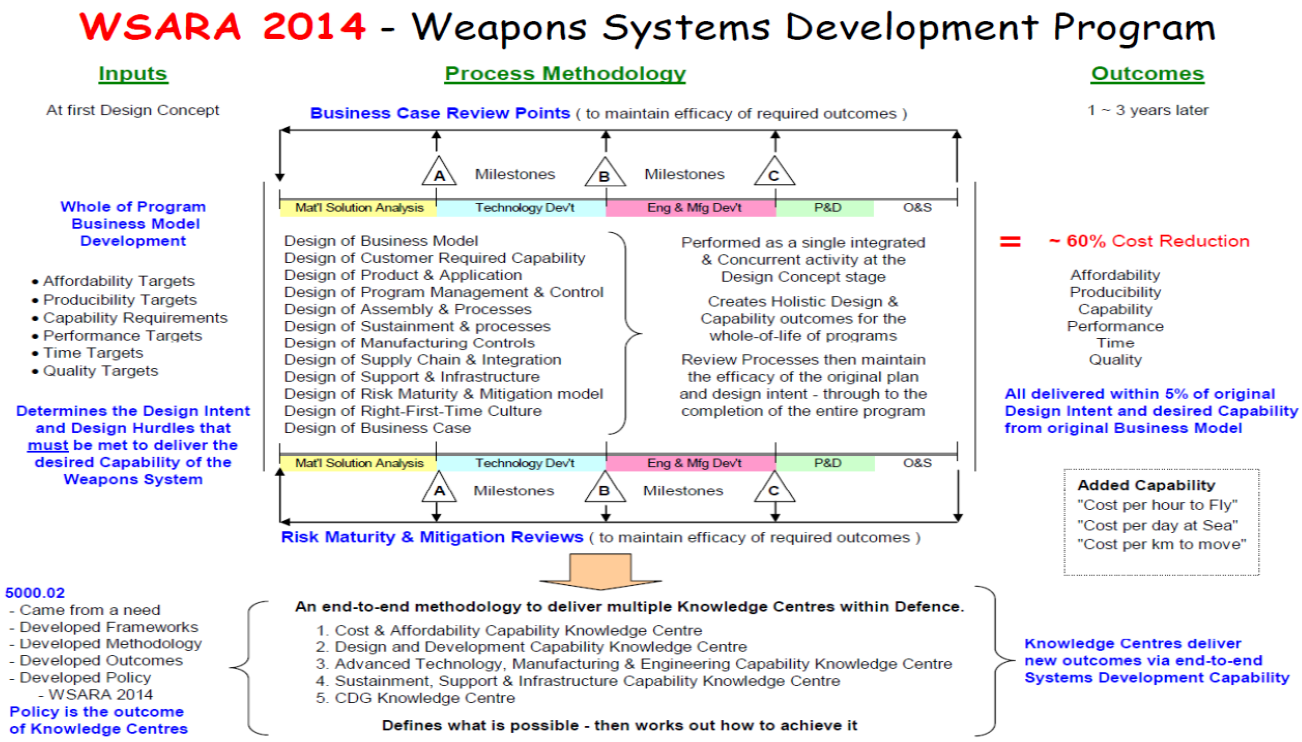
WSARA2014 (Blue line) has moved the decision point to far earlier in the program before Milestone A. Affordability and Producibility modeling have dramatically lifted the predicted performance outcomes to 100% by milestone A, and the risk maturity modeling maintains that level through until the program is completed and the weapons system is fully active in the hands of the warfighter.

Even when compared to WSARA2009 (Red line) this is a very major shift in the culture of better, far earlier decision making dynamics occurring across all future acquisition programs. **The difference in program capability and decision-making between these methods is represented by the Green area.**

At all performance levels and time points throughout the Weapons program development WSARA2014 is a very significant step-change in best practice thinking about how Defence weapons systems should be acquired with much better decisions, much lower costs, in less time, with far better producibility, better operability and capability, and with minimum risk to both the Government, and war-fighter capability.

WSARA2014 is an extremely robust weapons system acquisition break-through for Defence.

WSARA2014 new thinking process and methodology is demonstrated below.



Rather than just designing the equipment – first we design the business model for the weapons system – set all of the holistic hurdles and capability requirements that the entire weapons system must meet over the whole of its development and working lifecycle.

Once this is completed we begin the process methodology

Every design now has a series of very robust design hurdles that must be achieved and maintained throughout the whole development process.

The methodology and the very robust risk maturity modeling system maintain the efficacy of the required outcomes until the weapons system program is completed

WSARA 2014 Target + Hurdle System

- *Design for Cost - Target Cost – 5 to 50%* ⬇
- *Design for Time – Target Time – 10 to 40%* ⬇
- *Design for Quality – 40 to 90% Improvement* ⇧
- *Design for Simplicity – 50-80% Improvement* ⇧
- *Design for Producibility – >90% Improvement* ⇧
- *Design for Risk maturity - >95% Improvement* ⇧
- *Design for Confidence - >95% Improvement* ⇧

Typically outcomes of this WSARA2014 process are within 5% of the original targets and hurdles set before the milestone A decision point. A remarkable improvement over current program methodology.

WSARA2014 capability will allow Defence to design to the specific needs of the warfighter – not to what the prime wants to sell to Defence.

The only way that new weapons systems acquisition and sustainment procurement methodologies can prevent the failures of the past and achieve far better outcomes for all future Defence programs, and eliminate "projects of concern" is if these new industry best practice methodologies, which already exist, (WSARA2014) are adopted for all future weapons systems acquisition programs in Australia.

Improving program Acquisition to world best practice (or how to save $10b in Cost)

Given the financial pressures that face the government in funding the vast array of needed future Defence capability, which includes SEA 1000 & SEA 5000, when combined with the need for more affordable program sustainment outcomes, Defence will need to find new best practice methodologies like WSARA2014 that can deliver this much needed program capability in ways that are much more affordable to the government and with far less risk or problems than Defence's current methodologies.

Full details of each part of the proposal and its contents are explained in the full document