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Opinion

Opinions, essays, letters and comment on issues of national interest.

Plenty of bang from a dud

By Derek Woolner

Posted Tue Apr 8, 2008 8:02am AEST

People in the street dismiss the Australian navy's Collins class submarines as monumental duds. In stark contrast, most insiders that we interviewed as authors of the history of the project consider them a naval engineering triumph and a monument of Australian nation building.

From its inception in 1978 the project was seldom far from controversy and it was mercilessly attacked by the media and the Howard government for a myriad of technical failings - real, exaggerated and imagined. It is widely believed to have been a financial disaster, yet it is one of the few military purchases where the original budget was still relevant at the end of the project. Further, Australian industry responded successfully to the challenge of building submarines in this country, an achievement widely believed to be beyond Australian capabilities and one which many other countries have failed disastrously



Collins class ... From its inception in 1978 the project was seldom far from controversy. (File photo) (www.defence.gov.au)

During the 1970s the Australian navy operated British-built Oberon diesel-electric submarines on some of the most secret intelligence gathering missions of the Cold War. Nuclear submarines lacked the stealth for these covert operations, and the US Navy encouraged Australian military planners and politicians to maintain the long-range intelligence gathering capability in the Oberons' successors. At the same time the Australian submariners developed convincing arguments that submarines were most effectively used in long-range offensive operations in enemy waters.

Thus was born the desire to build the most modern long-range conventional submarine in the world. Modernity would be attained through a then revolutionary idea. Instead of taking whatever options for a combat system came with the design, the navy would specify the combat system which best met its needs and develop it separately from the submarine. Further, following intense debate, it was decided to build the submarines in Australia as a focus for industrial regeneration and to provide better long-term maintenance and support than was usually received from overseas shipyards.

These factors determined the nature of the Collins project. To US submariner, Admiral Phil Davis, the project was a huge undertaking, a 'monumental feat'. 'There is really nothing in the history of submarine construction that has been done like that', he said of the transformation of a small Swedish submarine into a 'radical new design', built 18,000 kilometres from the designer's office 'in a new yard with a new work force'.

Amazingly, the project's objectives were largely delivered. Today, Australia operates a sophisticated long-range submarine. Peter Sinclair, the first skipper of HMAS Collins, who has wide experience with other conventional

submarines, believes that the Collins is more capable than any conventional submarine at sea, with a turning circle second to none and 'super quiet at slow speed, quieter than anything else in the world.'

Few thought that Australia's recession-ravaged industries of the early 1980s could build a submarine. Yet, with the introduction of modern techniques that accompanied the project, over 70 per cent of its value was produced in Australia by hundreds of subcontractors who embraced exacting defence quality standards. The welding standards remain some of the best achieved in the world.

The project suffered its share of problems but the only surprise, given the ambition of the project, was that they were not better anticipated. With problems overcome through some remarkable defence science and assistance from the US, the submarines were delivered close to budget and an average of 26 months behind schedule. This is one of the shortest delays with any military purchase and remarkable for the largest systems integration project in Australian history.

The persisting failure has been the combat system, a testament to both the inadequacies of some of the world's major arms corporations and the unchecked ambition of Australian submariners. Even this disaster was salvaged by the expertise and ingenuity of Australia's project engineers and defence scientists, cobbling together a system to provide an acceptable performance.

Derek Woolner is a defence procurement expert in the Strategic and Defence Studies Centre at the Australian National University. He and Peter Yule of the University of Melbourne have written a book about the Collins class submarine procurement project, titled The Collins Class Submarine Story: Steel, Spies and Spin.

Tags: defence-and-national-security, navy, defence-industry, australia

Comments (52)

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• black mavrick :

08 Apr 2008 8:57:08am

How is it that the facts on military equipment can become so distorted. The Collins class has proved itself as a success in the face of adversity. If only we could get behind our country and believe we can rise to greater heights of achievement. Thankyou Derek for clearing the air on this issue

Agree (0) Alert moderator

chip:

08 Apr 2008 1:07:09pm

Building our own fighters for the RAAF would take us to greater heights.

Agree (0) Alert moderator

David Keig:

08 Apr 2008 2:34:02pm

Maybe we should paint all of our 'fighters' pink?

After all we all sometimes see that pigs do fly.

Agree (0) Alert moderator

Snacky:

08 Apr 2008 2:38:09pm

Readers, you are all so dumb. Sorry, but you are.

If you owned incredible submarines, wouldn't it be in your best interests to let the world think they were duds? Doesn't it lend itself that no one would think your subs could do anything? Wouldn't that make the owning of them more powerful?

Duh! think about it. It's been a long time scam to make people believe they are bad, because they are, in fact, quite powerful.

Agree (0) Alert moderator

jed fled:

08 Apr 2008 3:32:37pm

A very precise comment. Australia should back innovation, and back ourselves. We have so much talent, it is a shame it is not recognised more widely and is backed more effectively from Governments.

Political point scoring from both sides does not help the end goal of developing a new economy from backing Australian innovation.

I was led to believe the collins was a hack. Why?

Agree (0) Alert moderator

Eric:

08 Apr 2008 5:29:51pm

Its Politics, nothing is sacred The Howard opposition just wanted to beat up what was done by the Gov of the day.

Agree (0) Alert moderator

• PaulB:

08 Apr 2008 9:09:48am

The first piece published in the mainstream media, that I have seen, honestly appraising these wonderful pieces of kit.

Politicians will logically take advantage of the inevitable teething problems, a project of this size, will have.

But, my memory of the media's performance is a disproportionare & hysterical free for all, with no attempt to identify the facts.

Hopefully your book will be a reference tool for future articles, but I doubt it.

Agree (0) Alert moderator

Neal:

08 Apr 2008 9:22:09am

Let's be honest though Paul, the media beat didn't exactly hurt the Collins class when it comes to other countries perceptions of it's capabilities. Not exactly a bad thing having other countries think it is a piece of junk when it is conducting long rang surveillance just off their shores.

Agree (1) Alert moderator

• Nautilus:

08 Apr 2008 9:17:18am

If the Collins submarine was such a "dud", how come they beat the USA in virtually every war game and managed to "sink" US aircraft carriers in pretend engagements?

Not to forget the significant amount of acoustic intelligence that they gathered in the oceans?

Agree (0) Alert moderator

• War Pig:

08 Apr 2008 9:32:02am

Glad we spent billions on these outdated, clumpy, clunky "vehicles to gather secret intelligence". I bet they were really useful for invading Iraq. Were they hiding those weapons of mass destruction underwater?

Glad we put ridiculous sums of money into defence projects/white elephants. That must be why we're doing so well against our 'enemies'. Good thing we spent billions on those planes that don't exist too. The crowd at the grand prix will love them!

Just think of all the street kids, refugees, indigenous communities, climate change, water, energy, health and education that we could have wasted that money on!

Agree (0) Alert moderator

David L:

08 Apr 2008 10:56:28am

They're stealth fighters War Pig, Of course you won't be able to see them at the grand Prix.

As for your other points, I would prefer it if we didn't need to spend money on defence and could spend it on education and health care, but humans being what they are, I'm glad our government is paying for some of the best bits of machinery out their, and adding to our countries expertise in the process

Agree (0) Alert moderator

James:

08 Apr 2008 3:08:32pm

We're not really spending that much money on weaponry either - other nations in the region are spending a whole lot more then us.

It is great to see though that an Australian made product is doing so well. Seeing as Australia is girt by sea it makes sense to have some seafaring vessels involved in our defence.

Agree (0) Alert moderator

Davo:

08 Apr 2008 10:58:49am

Not that long ago the UK thought they no longer needed to put so much money into defence. You have heard of the Fawklands haven't you??

Much of Australia's wealth comes from resources in our exclusive economic zone that may become too good a target to ignore for those with the right political or financial motives. Especially if they see us as too weak to defend what is ours.

Don't underestimate the size and quality of a nation's defence force to deter potential threats and protect it's natural interests; analysing not just ours, but the history of other nations can help us to prevent repeating the mistakes of the past.

Agree (0) Alert moderator

David Keig:

08 Apr 2008 11:24:36am

Yes, the threat of a war with New Zealand always does need to considered when planning a long term military strategy.

Your point is well made and needs to be taken very seriously.

Agree (0) Alert moderator

martygeeoz:

08 Apr 2008 1:19:55pm

If you seriously state that a threat can only come from a country as close as New Zealand, then it clearly shows your utter ignorance about modern global warfare.

Agree (0) Alert moderator

• G:

08 Apr 2008 2:39:01pm

you're right. I'm ignorant about local threats, but it seems that lots of people are ignorant even about more distant threats.

For example, we were ignorant about WMDs, even though it's been whitewashed and the invasion is now touted to be some kind of liberation of iraq from it's evil oppressor. Disregarding for a moment of course, that such an justification is actually a war crime.

So it seems that we're in good company regarding our ignorances. I suppose you're about to claim that it's better to spend TOO much money on defence, than too little - i.e. better beef up our war toys so that we can defeat the WMDs that don't exist.

Balance needs to be struck. And it needs to be struck intelligently. It's meaningless to declare that 'we need a military' - and it's even more laughable in the light of iraq's supposed WMDs. What we need is a DEFENCE, not a MILITARY.

Didn't you ever learn that brains overcomes brawn at school?

Agree (0) Alert moderator

Simon:

08 Apr 2008 3:21:42pm

The Falklands?

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:25:34pm

Yes, I'm glad we spend lots of money on defence. I think Australia is worth defending.

Just think of all those millions of dollars spend on wide screen televisions, internet bandwidth, donating to "Green-donate-to-oursalaries-Peace" and holidays in Bali? That's what should be going to solving all your real issues - "all the street kids, refugees, indigenous communities, climate change, water, energy, health and education".

Agree (0) Alert moderator

• BBQ:

08 Apr 2008 9:34:25am

So the welding's great, but the combat system is a result of "cobbling together a system to provide an acceptable performance"? Boy, what an endorsement. Don't worry, I'm sure we don't need submarines with effective combat systems.

Agree (0) Alert moderator

• nick:

08 Apr 2008 9:34:51am

About time there has been recognition to the thousands of people involved in a great project. Too many times the media slams any Australian achievement focussing on a hiccup instead of the final big picture. I salute those involved and thank them for choosing their profession, for progressing industry and making Australia safe.

Agree (0) Alert moderator

Barry:

08 Apr 2008 12:26:39pm

In order to be of use a warship has to be able to float, steam and fight. The Collins class still can't operate at its intended maximum diving depth, a huge drawback in a real shooting war, owing to unreliable pumps. The combat system had to be ripped out and replaced but still doesn't work properly. Apparently they can still 'steam'. One out of three ain't bad, but it's hardly meets any worthwhile definition of success.

Agree (0) Alert moderator

• WP:

08 Apr 2008 1:50:36pm

What the intended depth overly operstimic? Is the depth it can go to more than enough to evade detection etc, how does it compare to other subs in this respect.

To state it cant do everything that was hoped for at the beginning of a project doesnt make it a a poor weapon if the original aim was very high. It may have not reached the hoped for result and still be the best in the world. Same for the weapon systems.

Agree (0) Alert moderator

David Hoole:

08 Apr 2008 10:16:56am

Everyone loves to bag the combat system on the Collins submarines. But, the people who do so have utterly no conception of the complexity of the project.

I actually worked on the Collins combat system. I was a senior software engineer with CSC (Computer Sciences Corporation) in the early 90's and worked on both the Anzac Frigate and Collins submarine.

The problem with the combat system was that nobody at the time fully understood the vast complexity of a modern submarine combat system.

We had a budget of somewhere around \$80 million. In comparison, the US spent somewhere about US\$2 billion on the BSY-1 project to build a new submarine combat system and then abandoned the project.

Under the circumstances and with the tiny budget we had - in comparison to the US, we did remarkably well.

Overall, the Collins subs are a remarkable achievement. The building of them injected a massive technology boost into Australian industry and created thousands of jobs. We should all be very proud of them.

And, I hope that we, as a nation, will have the courage to undertake world class projects like this in the future.

Agree (0) Alert moderator

• lan:

08 Apr 2008 10:40:44am

I have friends who are submariners and they all praise the Collins class submarines. I am told that although there were some teething problems at the start they are great weapons now.

Well done to the Navy and Australian Shipbuilding Industries.

As for War Pig's comment, unfortunately military spending is a must to protect our way of life. Isn't it great that we live in a country where we feel safe and can have our say on Government spending without fear of retribution... try that in some countries and you would never be heard from again!

Agree (0) Alert moderator

War Pig:

08 Apr 2008 11:32:02am

I'm not saying that we should scrap all military spending. I just think the opportunity cost of how we currently do it is too great. Part of that is due to policy makers (eg Mr. 7%, sorry 9%, who's now out in safe liberal electorates "listening" to why no-one listens to him).

What good are a few submarines going to be? I realise that they're fun to play with, but what actual good are they going to achieve? At best we detect an 'enemy' that's invading, but we will not be able to stop them.

When are we going to get those new planes? They'd better appear at a lot of airshows to get their money's worth.

Apart from The Crusades, wars are fought over natural resources as long as there's sufficient political will and public opinion to get away with it. Most of the world's natural resources are being exploited by multinationals (some are state owned) and they hire their own mercenary forces. Our armed forces just provide the training.

Our DEFENCE force acts mainly in a peace keeper roles. All the juicy action occurs at a diplomatic level.

I admire the courage and dedication of our service men and women. They keep many places safe, and they achieve this by putting themselves in the way. I bet your submariner mates are great people too. Submariners are some of the best people you will ever be lucky to meet.

My gripe is about throwing vast amounts of money around with very little strategy or economic analysis. The opportunity cost is too great to throw money around like that.

Agree (0) Alert moderator

Cricket:

08 Apr 2008 3:24:08pm

"What good are a few submarines going to be? I realise that they're fun to play with, but what actual good are they going to achieve? At best we detect an 'enemy' that's invading, but we will not be able to stop them."

I disagree with this. Looking at the worst case scenario - a seaborne invasion of Australia - a very quiet submarine armed with 20 or so torpedoes could do immense damage to a fleet of troop ships. Submarines are also very effective in economic blockades (denying your enemy seaborne supply), intelligence gathering and covert operations. They're also the best-equipped ships to go after enemy submarines too.

Basically, the real power of a submarine lies in its ability to remain undetected. Nothing generates fear in a sailor like the knowledge that an enemy submarine just might be out there waiting for you, or trailing silently behind your vessel with a locked-in firing solution. You won't know for sure it's there until your sonar picks up the high-speed screw of a torpedo hurtling towards you at 50 knots.

Agree (1) Alert moderator

Roodbert Delove:

08 Apr 2008 5:39:19pm

And exactly how much of your superannuation is invested, and relying, on these evil "multinationals"?

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:46:17pm

I think you just killed your entire 'argument'?

"Apart from The Crusades, wars are fought over natural resources as long as there's sufficient political will and public opinion to get away with it. Most of the world's natural resources are being exploited by multinationals (some are state owned) and they hire their own mercenary forces. Our armed forces just provide the training."

Australia has a VERY LARGE AMOUNT of one natural resource - land, space, area, countryside.... this is a premium resouce in our 'end of the world'...

Glad you'd rather defend 'street kids, refugees, and indigenous races'.

I'd rather defend AUstralia - it's great place to live may I remind you?

Agree (0) Alert moderator

James A:

08 Apr 2008 10:41:16am

I think as with any one who has worked on large projects in business and government knows, it is perception that is more of a measure of success than if the project actually worked.

I know projects that have been trumpeted as massive successes and considered so while projects that have been amazing success stories are the objects of mockery and derision.

Agree (0) Alert moderator

David Keig:

08 Apr 2008 10:59:43am

Submarines are clearly ideal in todays post September 11 world.

Iraq, Afghanistan, Tibet and Dharfur are just a few of the world's current hotspots where submarines are proving themselves to be indispensable.

Perhaps all of our Australian submarines should be painted white and re-named the Elephant class.

Agree (0) Alert moderator

WP:

08 Apr 2008 12:17:55pm

Actually our Submarines were used in the first gulf war (the oberon subs) as Iraq has a coastline. Our Subs were their.

East Timor? Were our subs their? I dont know however if I was a betting person.....

I do agree that in our current conflicts, they are unlikley to be of much use.

The problem is you need them just in case. To design and build a new SUB takes many years. Even if we decided to build more collins class the same as we have with no new design, it would be years before they are delivered. If the occasion arrises where we need them, that situation will develope much faster than we can ever hope to build and train the personel. The fact that we have them may be enough to stop such a situation arrising.

Read up on the Fawklands.

The first time Argentina (spelling?) started building up forces to invade in the 70s, the UK held navil exercises in the area to send a political message.

The second time they were retiring the only ship that was in the area and were not replacing it. Their was no exercise in the area to send a political message.

Agree (0) Alert moderator

David Keig:

08 Apr 2008 2:28:08pm

Iraq's coastline is about the size of Cronulla beach.

The Gulbenkian accord in the early 1920's made sure that oil rich Iraq could be isolated if any 'local disturbances' happened.

Saudi and Iran were exempt from this.

They were regarded as 'vassal nations'.

Dragons teeth i think.

Agree (0) Alert moderator

jim:

08 Apr 2008 2:50:19pm

WP,

Are you definite that an Australian O'Boat was in Operation Damask?

I would be surprised if any submarine was present in that small body of water 'off Iraq's coastline at that time for 3 reasons; (a) extreme mine warfare threat,

(b) majority of areas far too shallow to operate either conventional (regardless of size) or nuke boats and

(c) overbearing amount of fleet traffic.

As you would have read the neutrally buoyant mine threat as well as 'free floaters' provided a nightmare for all shipping traffic for the entire perid of the conflict as well as the subsequent months. In fact I recall that the threat was that bad that large areas had to be declared off limits until cleared by mine hunter's, which, paved the way for operations further north by maritime forces as the ground war progressed.

WP, not that the O'Boat wasn't capable of travelling the distance to the Gulf, however, I do not recall there being any mention from the Maritime Commander that an Australian 'g'sunder' was in the area at any point while we were there. We would have known.

Your spelling of Argentina is correct. How about 'Naval' and 'Falklands'.

I think that you'd be also surprised to know that the RN maintained an ongoing maritime capability around the Falklands right up to the war and that the ongoing redployment of forces from that South Atlantic was not the reason why Argentina decided to strike when they did.

The statement that there is not much call for submarine operations in the present climate may miss the point. The whole idea of maintaining a submarine capability is about deterrance. It is about sending a message.

To conclude, the Collins has taken some time to refine. We just need well over the 6 crews required to keep up the capability.

Agree (0) Alert moderator

Ford:

08 Apr 2008 1:18:15pm

Of course, the only reason we have any capability in East Timor, Iraq and Afghanistan is because we invested in equipment and personnel previously.

Could it be, David, that professionals in the armed forces arena know slightly more about the security issues we face as a nation and the capability we need to deal with them than you do?

Clearly you can predict the future and know already what our requirements will be from here to the end of time, maybe you could email Fitzgibbon and let him know.

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:40:40pm

Ford surely you recognise the greatness in David?

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:41:21pm

Davids are clearly ideal in todays post September 11 world.

Agree (0) Alert moderator

• David Keig:

08 Apr 2008 12:02:31pm

This is one of the most damning lines in the above article:

It is widely believed to have been a financial disaster, yet it is one of the few military purchases where the original budget was still relevant at the end of the project.

Phew! Thank God our military people are so careful with taxpayers money.

Agree (0) Alert moderator

• BlzBob:

08 Apr 2008 1:25:38pm

Ok now that we have proven our capabilities, we should give aircraft a go, and start on our own version of the Raptor.

Agree (0) Alert moderator

shane:

08 Apr 2008 1:28:43pm

I love the simplistic approach of many people - can't use submarines in Iraq etc etc.

Subs are a great deterent (if you wanted to invade, you have to get the people and equipment here). Invasion is very hard to do when your ships are sunk on the way.

Additionally, where do people think intelligence comes from? Not from a guy walking through a foreign country with a radio receiver on his back!!!

And finally - to the hippies who think everyone should just love each other and there is no threat in the future... take a look at the last few

thousand years of history. You need a credible defence force.

Agree (0) Alert moderator

War Pig:

08 Apr 2008 1:56:52pm

I have had a good look at the last few thousand years of history. Apart from The Crusades, they've all been fought over natural resources. I discussed it in a previous comment.

Nice work Shane, that's just the shoot-first-ask-questions-later-attitude that's caused so much trouble over the last few thousand years. Read what's in front of you before you shoot your (and maybe someone else's) mouth off.

I wouldn't carry on about intelligence either. How much can you tell from a sub that you couldn't get from a satellite. War is not only mechanised, but it's automated these days.

Agree (0) Alert moderator

Ford:

08 Apr 2008 2:11:21pm

How many spy satellites do you think Australia has?

None! That's right, we have no spy satellites, no plans to make any, no real capacity to either.

Your natural resources comment is spot on though, and this situation will only get worse if climate change is even half as bad as many are predicting.

I think drawing a line between Shane's comment and the attitude that's led to so many armed conflicts in our brief but violent history is drawing a rather long bow.

Agree (0) Alert moderator

• War Pig:

08 Apr 2008 3:51:37pm

Of course we don't have any satellites, but there are armed forces that do. We're not going to be much more than a speed hump for any significant military power, no matter how many subs we have.

We can't seriously expect to match it with a world power, their capacity is several orders of magnitude greater than ours. That's why we died for the Brits in the world wars. That's why we died for the sepos in the Korean, Vietnam and Gulf Wars.

Fair enough, the attitude call might have been a bit rich but Hannibal sure how to deal with a hotheaded suckerpunch in Cannae. It's ocurred often enough throughout military history for it to be taught at West Point.

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:36:52pm

You mean WW1 was fought over natural resources?

Geee... I couldn't find too many references to such in wikipedia...

http://en.wikipedia.org/wiki/Ww1

Perhaps you could educate us further.

Agree (0) Alert moderator

Tim:

08 Apr 2008 1:51:02pm

I watched the ABC series about life on the Collins Class. If that didn't convince you it was a lemon, nothing will. Of particular interest was the major mechanical problems they have with the engines and shafts none of which it would have had if it was nuclear powered. Sadly the specification was built more on concerns of green protests on the docks than on its ability to reliably defend the country.

Agree (0) Alert moderator

WP:

08 Apr 2008 2:47:50pm

I watched the same series and came to the conclusion they were brilliant. Any large ship large plant or piece of machinery has ongoing problems. They dont run like a car where you take them in every 10,000km for an oil change. Problems are part of it all. I dont think their would be any ship in the world where things are not reguarly breaking down and needing replaysment.

Agree (0) Alert moderator

• Robert Stewart:

08 Apr 2008 2:03:15pm

Time now to plan the next generation of these quiet, sneaky, fish that can manoeuvre underwater like no other. and remain undetected - as demonstrated at the fleet exercises off Pearl Harbour a few years ago

Agree (0) Alert moderator

• Fred75:

08 Apr 2008 2:05:02pm

Our choices where either to buy nuclear sub off the US (which costs billion in support services and are nosier that diesel electric), or buy on the cut lunch diesel subs (as take a cut lunch because you'll home before dark subs).... in reality we had no choice but to build a new long rang diesel sub.

Subs are one of the most useful and versatile navy craft let alone their ability to scare an enemy fleet back into harbour (just ask the Argentina's navy about that).

Sure it would be fantastic to spend all that money on various other objective but we don't live in a peace loving world... we live in a world where we are surrounded by water, next to the largest Muslim nation on earth, close to China and far away from allies.

Indonesia just bought up a load of kilo class Russian subs, and Russian aircraft... We have to be armed enough to at least defend ourselves from them.

Agree (0) Alert moderator

War Pig:

08 Apr 2008 4:23:07pm

With well over 400 000 in their armed forces they could attack us with spoons and still win.

Agree (0) Alert moderator

• Jim:

08 Apr 2008 3:11:28pm

Gees, sounds good, so now and then it can fire a shot? Bargain.

Plenty of bang from a dud - ABC News (Australian Broadcasting Corporation)

Agree (0) Alert moderator

• DNW River:

08 Apr 2008 3:47:13pm

I would be interested in some informed comment on the impact of changing over to the US torpedos - did that make much difference to the performance?

Agree (0) Alert moderator

• wotrot:

08 Apr 2008 4:14:55pm

This stuff is sheer fantasy- who pays this writer? The navy didnt want this monstrosity. It was happy to buy four German subs off the shelf at a fraction of the cost. Beazley overrode this and implanted a nonsense into the marginal electorates of South Australia. The productivity of resouces employed here make the car industry look mean and lean. Cut the crap, Woolner. Wotrot

Agree (0) Alert moderator

Roodbert Delove:

08 Apr 2008 5:20:03pm

Neal is the only commenter who has grasped the idea.

Letting the adversary think you are under equipped is a major tactical and useful strategic advantage.

Don't forget, this machine is a weapon.

Agree (0) Alert moderator