Strategic Sea Mobility for the ADF

by Dr Carlo Kopp

The recent announcement in the press that Australia will invest in new, and possibly large amphibious vessels raises a number of very good questions about what direction the RAN will be taking with its future amphibious capabilities. There is little doubt that a significant growth in this type of capability is required. The bigger question is how to best implement such a capability, given the diverse needs it has to fulfill and the complex strategic environment in which it needs to operate.

The reality of the post Cold War era is the ongoing instability in the developing world, manifested at its worst in the War on Terror in Muslim nations. Closer to home, Australia confronts an 'arc of instability' which spans South East Asia through to the Pacific Island States. Shifting patterns of wealth, mobility of global capital and labour, and the disappearance of competitive allegiance buying in the Third World by the West and former Soviet Bloc have all contributed to this situation, which is unlikely to abate soon. The coming decades will be characterised by ongoing expeditionary actions by developed nations in the developing world, to deal with terrorist movements and the breakdown of civil order.

This is a reality superimposed upon the wider regional strategic context, in which the increasing industrialisation of Asian nations sees increasing investment in modern air and naval power, and the modern guided weapons technology that comes with it. The Asia-Pacific-Indian region will present, in coming decades, the most complex and sophisticated maritime and air environment observed since the collapse of the Soviet Bloc. Australia is presented with a number of serious challenges if it is to maintain its relative strategic position in this part of the world.

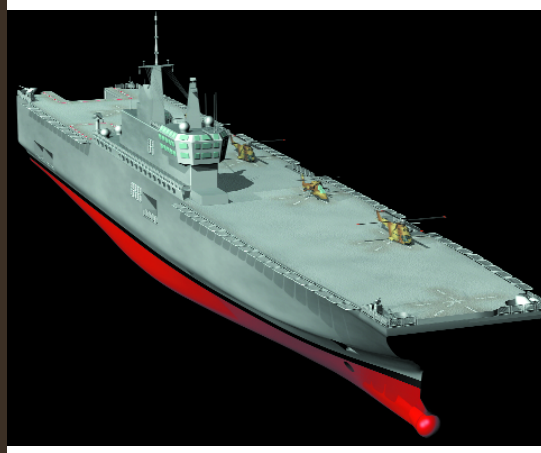
This is the context in which Australia finds itself today. The RAN's legacy force of amphibious vessels, accreted over several decades, is not competitive in this environment. The Manoora and Kanimbla (LPA), the Tobruk (LSH) and six landing craft (LCH) are ill suited to the developing environment, and are limited in remaining life. The question is thus not one of whether to replace, but how to replace these assets to best effect.

Technology and Trends in Amphibious Operations

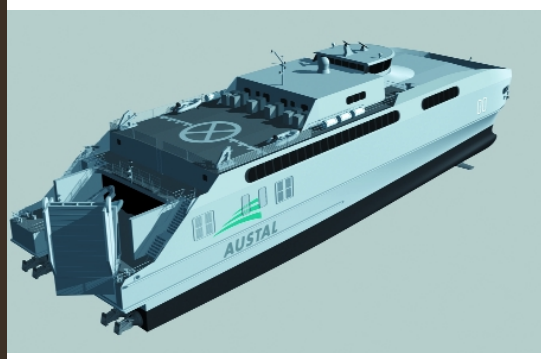
The role of amphibious vessels is to deploy and sustain land forces in expeditionary operations. The first large scale use of specialised amphibious vessels was in World War II in the Pacific, when the US Marine Corps and Army conducted the Island Hopping campaign to drive out the Japanese, and during the invasion of Europe via Normandy. Since then we have seen notable amphibious operations conducted during the Korean War (Inchon), the Falklands (Operation Corporate), the invasions of Grenada and Panama, and a host of much smaller operations conducted in support of peace enforcement, peacekeeping and counter-terrorism operations. Australia's engagement in East Timor was the largest amphibious operation conducted by Australia. More recently, the US Navy used its amphibious vessels during Operation Enduring Freedom and Operation Iraqi Freedom. An interesting example during the former campaign was the use of a CTOL/CV aircraft carrier as a temporary amphibious base for Special Forces operating in Afghanistan.

Historically, amphibious vessels have been used mostly to perform amphibious invasions of territory held by opposing land forces, both to provide a manoeuvre force element in littoral environments or a main force delivery. However, the developing trend is to also use amphibious vessels as staging and deployment platforms for Special Forces raids. In the developing world basing for Special Forces in close proximity to hot spots often presents genuine problems, both politically and in terms of on-site security. An amphibious vessel provides a highly flexible alternative for positioning a Special Forces element and its supporting helicopters close enough to strike.

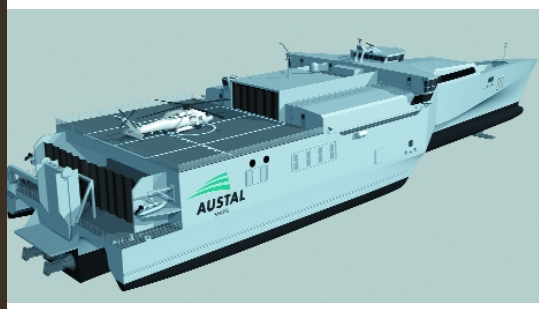
Recent decades have seen considerable evolution in the style of vessel used for amphibious operations. During the 1940s and 1950s, 'phibs' were primarily large transports equipped often with docks to permit landing craft to deploy personnel, supplies, vehicles and especially armour. The advent of the helicopter, especially gas turbine powered helicopters, changed this dramatically, as troops, supplies and light vehicles could be flown to shore, leaving only the heaviest equipment, such as tanks and large artillery pieces, to be deployed by landing craft. The next important advancement was in the Air Cushion Vehicle (ACV) landing craft, capable of much faster transit than conventional technology. A unique development in this domain were the large Soviet Wing In Ground-effect (WIG) amphibious assault platforms, exemplified by the 'Caspian Monster'. Designed to operate as high-speed amphibious assault platforms, the WIGs presented a formidable capability in the littoral environments of the Baltic Sea and Black Sea.



By the 1990s an important trend emerged in amphibious vessels: a shift away from specialised single purpose amphibious assault helicopter carriers, tank landing ships and transports to 'multirole' amphibious assault ships – combining the characteristics of a large transport, a helicopter carrier and an amphibious dock. Very good examples are the US Navy's Tarawa and Wasp classes, built to deploy around 1,800 Marines with equipment and carry a mix of 30 to 40 helicopters and fixed wing aircraft. Designed to operate with considerable autonomy, such vessels provide for troop deployment via ACVs and helicopters, and some measure of organic close air support capability via AV-8B Harriers and AH-1 attack helicopters.



The US Navy and Marine Corps have by far the largest and most developed amphibious capability globally, and thus present a good example for exploring key technology and force structuring trends in this area. Other than the previously noted trend to multirole vessels, which combine the features of multiple categories of legacy amphibious vessel, the other important trend observed in the US amphibious fleet is the drive to increase the range from which a vessel can deliver its payload to shore. The uncompromising insistence by the US



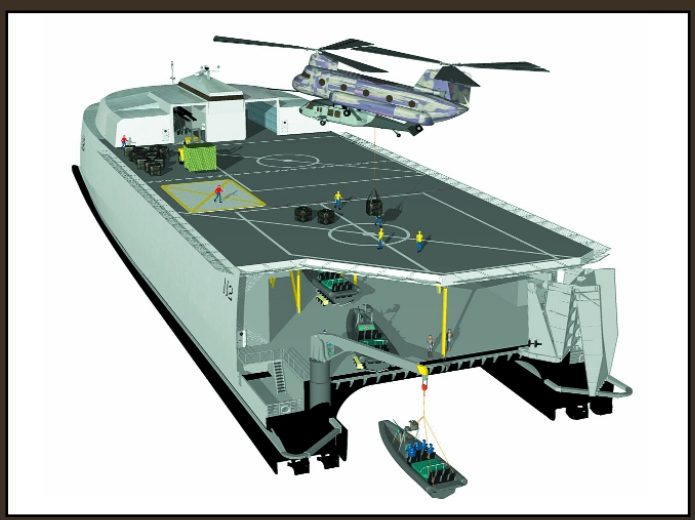
Marines on the CV-22 Osprey V/STOL tiltrotor as a replacement for much of the CH-46 and CH-53 assault helicopter fleet and the US Navy's interest in fitting the X-band SPY-3 phased array and RIM-162 ESSM Anti-Ship Missile Defence package on the LHD-8, LPD-12 and LPD-17 amphibious ships both present good examples of the long term impact of the proliferation of coastal defence Anti-Ship Cruise Missile (ASCM)systems.

Amphibious ships are very high value targets, both due to the size of the vessel and its valuable payload. The focus of much of the 1944-1945 kamikaze effort was in attacking amphibious vessels, and the effort invested by the Argentines in the Falklands was no different, albeit almost four decades later. If a defender can cripple or sink a larger amphibious vessel, the amphibious operation can fail leaving a force stranded on the beach and unable to hold its ground.

In the contemporary world the biggest concern focuses on coastal batteries of Anti-Ship Cruise Missiles, followed closely by air, helicopter, fast patrol boat and submarine delivered weapons. In this region these range from EU-built Exocets, US-built Harpoons, Russian-built Yakhonts to Chinese-built Silkworm/Seersucker and Sardine ASCMs. As the handful of Exocet hits during the Falklands campaign demonstrated amply, even a small ASCM deployed by an unsophisticated and underskilled operator can cause enormous damage. Amphibious ships carry large payloads of fuel and munitions, which can render damage control effort futile, if the weapon hits the right place.

Heavyweight missiles such as the widely deployed subsonic Styx/Silkworm/Seersucker family and the new supersonic Yakhont/BrahMos are especially concerning – since they have large warheads, the mass to penetrate deep into structure and, subject to range, considerable residual fuel onboard. While many advocates of larger warships like to argue the capacity of such vessels to absorb hits, the survivability of even a 40,000 tonne vessel if hit by a weapon in this class is open to question.

While delivery of ASCMs by aircraft, helicopter or fast patrol boat requires some sophistication by an opponent, using a road mobile coastal ASCM battery does not. Once the bearing and range to the inbound amphibious fleet are approximately known, the battery can 'shoot and scoot'.



US thinking to date has been to rely on the range/speed of the CV-22 Osprey to deny firing opportunities by assaulting from ranges outside the reach of most sea skimming ASCMs. Amphibious fleet operators without the budgets for CV-22 fleets do not have this option - the range and cruise speed of assault helicopters would impose hard limits on the distances from which an assault can take place.

An important recent development in amphibious operations is the introduction of larger wave piercing catamarans developed by Australian industry, especially for littoral operations. Catamarans provide often twice or more the cruise speed of conventional 'phibs' reflecting in double the productivity of a conventional vessel with an equal payload. Well suited for operations in shallow littorals, catamarans have become one of the foci of the US transformational effort in naval force structure. With a large ratio of helicopter deck area to internal volume, and hull geometries easy to apply stealth faceting to, we have yet to see catamarans reach their full potential in either capability or size.

Roles and Missions for the Amphibious Fleet

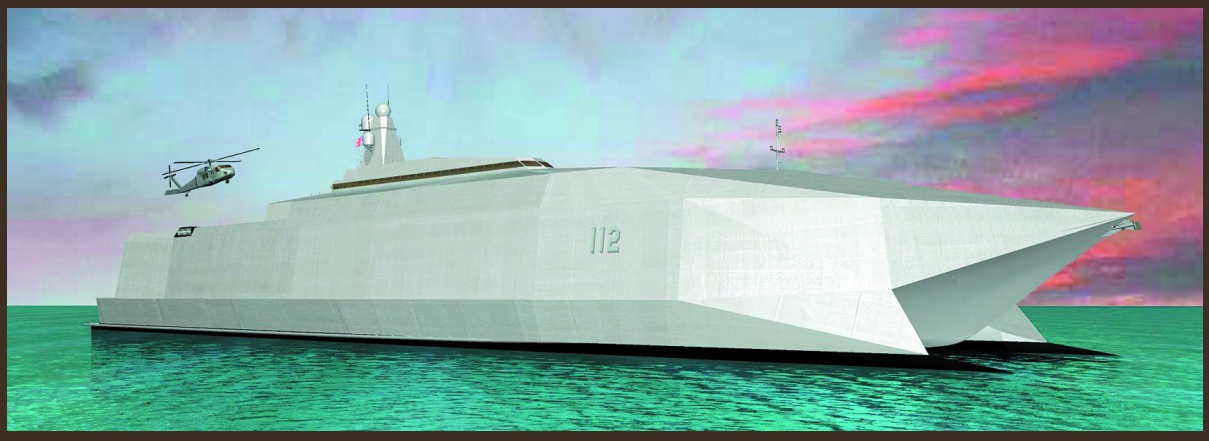
For Australia, perhaps the key issue in building a new amphibious assault fleet will lie in finding the best balance between utility and survivability, across the range of scenarios in which such vessels might be used.

Key roles for the RAN's replacement amphibious fleet include:

- Regional and global Army deployments in support of peace enforcement and peacekeeping operations.
- Regional and global Special Forces deployment and recovery, counter-terrorism raids.
- Evacuation of Australian nationals and natural disaster relief operations.
-.Coalition operations within the region and globally.
- Power projection within the region in a nation state conflict scenario.
- Combat search and rescue (CSAR) operations.
-.Anti Submarine Warfare (ASW) operations as an ASW helicopter platform.

The nature of the globalised world means that ADF ground forces may have to fight on the global stage, but also develop and maintain highly credible capabilities for combat within this region. This has important implications, both in terms of the characteristics of the littoral environment in which amphibious ships will have to operate, and in terms of opposing capabilities.

Peacekeeping and peace enforcement operations typically present the low end of the threat spectrum, as opposing forces are unlikely to have at their disposal credible anti-shipping weapons. The same is apt to be true of most counter-terrorism operations using Special Forces, plus operations where civilians need to be extracted from problem areas.



The benign operational environment disappears in situations where the vessels may be required to perform coalition operations against rogue states or larger non-state actors regionally, in situations of nation state conflict regionally, or in CSAR or ASW support operations in support of any of the previous three environments.

In an opposed environment the RAN's amphibious vessels may find themselves in situations where an opponent has respectable air and missile capabilities, and has some competencies in using these assets. Current thinking is that the new Air Warfare Destroyers will protect the amphibious ships from air and missile attack. Advocates of larger amphibious vessels have openly argued that these ships should carry STOVL Joint Strike Fighter aircraft, the aim being to provide organic air support for the land force, and organic air defence for the amphibious group. Neither of these arguments seem particularly credible considering the capabilities of the anti-shipping missiles appearing in the region, and the level of capability of Sukhoi fighters being purchased. What STOVL JSFs do achieve is to increase the value of the vessel as a target, while displacing valuable helicopters from the available hangar and deck space. In effect utility is traded away in an attempt to improve survivability.

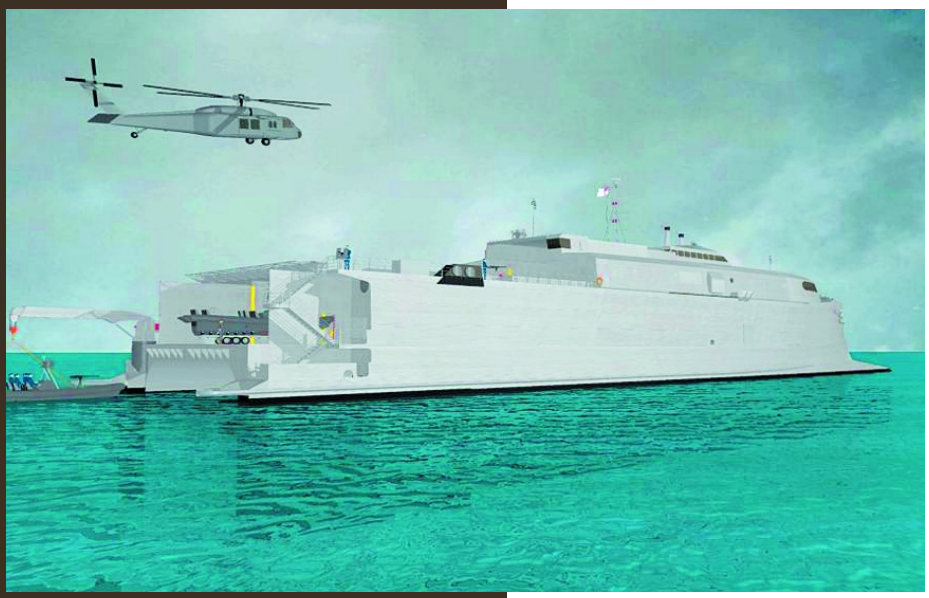
The recent public and political debate over the acquisition of either two larger vessels or four smaller vessels appeared to focus mostly on flexibility. Smaller vessels are indeed more flexible in terms of permitting more concurrency, and provide some redundancy should a vessel be unavailable for operations due to overhaul or mechanical problems. The bigger issue should however be survivability.

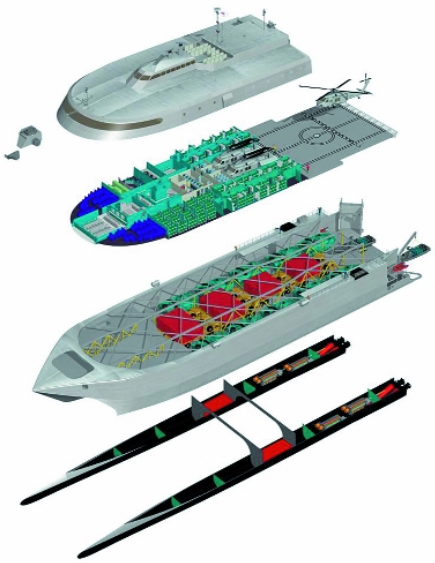
An investment on this scale cannot be made for a single role, and optimising the buy with a capability that is ideal for large scale peacekeeping, peace enforcement and other 'benign environment' roles is, in effect, building in a genuine risk that the investment will be unusable in more hostile environments. A Timor-like scenario in which the opponent resists using naval and air assets, and coastal missile batteries, is a good example. Operation Corporate in the Falklands should not be forgotten.

Another consideration is duplication of capabilities already extant in the US Navy. If the aim is to use these vessels in support of US-led coalitions, then deploying vessels analogous in capabilities to US LHDs adds only incremental mass to an existing task force rather than a unique and valuable niche capability.

Given that a key role for any ADF amphibious capability is apt to be raids against terrorist enclaves, which if regional in location will be littoral, smaller and faster vessels will yield a much better return on investment than a large LHD. Roles such as Special Forces insertion, extraction, CSAR and ASW support are all roles where several larger catamarans would prove more effective than one or two very large LHDs.

This concept of operations needs to be explored carefully before committing to a shipbuilding program. A Hi-Lo mix of conventional LHD capability, and fast catamaran capability would provide much more flexibility, redundancy and survivability than a pure LHD solution.





An interesting example is the Incat proposal for the 112-metre Amphibious Helicopter Transporter. It is designed to carry a dozen MRH-90 helicopters, launch or recover three, and move 600 tonne class payloads at a 30+ knot cruise speed. This contrasts with the 15-knot cruise speed 20,000 tonne or greater Izar and Armaris conventional LHDs which are the primary focus of the current JP-2048 study phase.

If anything is clear from recent evolution in amphibious ship technology and ongoing operations, flexibility, speed and survivability are ongoing issues. There is a very strong case to be made to broaden the scope of the JP-2048 studies and explore a wider range of options, and a wider range of operational scenarios. In a rapidly evolving world doing anything less amounts to planning for an era long past.