One of the most promising Defence projects using Australian-developed technology is the upgrade of ANZAC frigates utilizing 4th generation phased array radar technology. Developed by Canberra-based CEA, this fully digital Anti-Ship Missile Defence (ASMD) solution will soon be installed on HMAS ‘Arunta’, the second ship of the class to be equipped after HMAS ‘Perth’. ‘Arunta’ has been on a hard stand at Henderson in Western Australia since April undergoing preparatory work, with the ASMD part of the task to begin on schedule in the coming weeks.

The performance of the system on ‘Perth’ during the past 18 months has been outstanding. The ship undertook completely successful live firings of its anti-air Evolved Sea Sparrow Missiles earlier this year with trials off the coasts of Australia and Hawaii. The most recent events have been at the major RIMPAC exercise, which concluded on August 7. Asked to describe what was involved, a Defence spokesperson said:

“The Anzac Class frigate HMAS Perth conducted consecutive firings of Harpoon Block II missiles on 7 and 9 June 2012 at the United States Sea Test Range, Naval Air Station Point Mugu.

“The firings were planned in detail by the recently formed Australian Maritime Warfare Centre (AMWC), which operates from Garden Island, Sydney. The AMWC is a repository of extensive maritime warfare subject matter expertise and corporate knowledge and is home to naval warriors, Defence scientists and civilian engineers, technicians and analysts. A specialist weapons test team from the AMWC embarked in Perth to oversee the firings.

“HMAS Perth, commanded by Captain Mal Wisely, launched the first harpoon against a land-based target and the second against a moored target very close to the beach. Both missiles hit their marks, highlighting the accuracy and precision of the weapon system and demonstrating the crew’s very high levels of skill and proficiency.

“These firings significantly increase the versatility and potency of one of the Navy’s key weapon systems. The Navy now has the ability to conduct long range attacks against coastal land targets or ships operating in the littoral region and in close proximity to the coastline. The demonstration of this capability and the successful upgrade of the ship’s systems to accommodate the advanced harpoon missile make a great contribution to the Defence’s ability to project power to protect shipping or support forces ashore.

“Prior to the firings, HMAS Perth completed the first phase of an upgrade to improve her weapon systems and sensor arrays. The improvements under the Anti-Ship Missile Defence (ASMD) upgrade include a new Australian designed and built digital Active Phased Array Radar and increased performance for the existing combat management system. On 28 November 2011 the Government announced that the ASMD upgrade would be fitted to all ANZAC Class frigates over the next five years.

“From an ASMD upgrade perspective, RIMPAC provided Navy with an excellent opportunity to conduct operational test and evaluation of the new capability introduced under this program. Navy fired two missiles, both of which were correctly supported in flight by the CEA Phased Array Radar System and the SAAB Mk3E Combat system. This is particularly good news as we move into the subsequent ship upgrades following HMAS Perth and provides a...
very good baseline going into ASMD Stage 2 and associated trials in the second and third quarters of next year."
In addition, ‘Perth’ won the coveted Gunnery Championship trophy at the exercise. Known as the Naval Surface Fire Support (NSFS) Rodeo Championship, according to the Royal Australian Navy it is judged on consistency of accuracy, measured from the distance from the aim point to the observed impact point. The results are measured using an acoustic range that provides a high degree of accuracy in measurement.

Asked if other Navies are taking an interest in the ANZAC ASMD solution, Defence croyly replied: “Several Navies have expressed interest in the CEA technology developed under ASMD.”

CEA TECHNOLOGIES
According to CEO Robert Forbes, one of the interested navies is the USN and there is a possibility that it could be considered some way down the track for later batches of the Littoral Combat Ship (LCS). However, the Pentagon is grappling with the reality of budget reductions – which could get much worse – and as the LCS is designed as a low cost, lightly armed combatant it might well remain in its current configuration for several years. In positioning itself for the US market, CEA is advantaged by having Northrop Grumman as a significant shareholder and as a consequence anticipates receiving an order for a small system for land based testing. Another interesting prospect is Canada, with its Canadian Surface Combatant Project.

Locally, everything continues to go remarkably well with the project. Robert Forbes says the company is aware that the sailors using the system have expressed great enthusiasm for it as it is proving to be an extremely reliable high performance product. At the moment work is well underway on the second ship set, with three and four also in production. Around 100 staff are working on the project with most of them located in Canberra and others in Adelaide and Melbourne.

SAAB SYSTEMS AUSTRALIA
Saab are now close to the completion of the full functionality of the ESSM missile and its modes, Link 16 and VMF data links, full functionality of the Phased Array radar control and few other CMS functions such as the addition of an Air Intercept Control mode and the upgrade to Harpoon Block 2. ‘Arunta’ will be the first ship to be equipped with this extra functionality and tests and trials will be completed in mid-2014. Following ships will be done in bunches of three.

In addition, Saab Systems is supporting the hardware upgrades of all follow on ships and gearing up for other upgrades to the Anzac class – such as SEA 1448 Ph 4A - ESM replacement.

The company points out that more broadly they are working on concepts for new capability in the Combat Management System so that ships can plan and exploit non real time data. This can provide functions such as over the horizon planning and Anti Submarine Warfare improvements.

BAE SYSTEMS
BAES are responsible for the physical integration of the system onto the ships, including the fabrication and installation of the main mast. The company lists its ongoing tasks as:
- Procurement of materials and equipment to support the fabrication and installation phases for HMAS 'Arunta', next vessel in-line to receive the ASMD Capability. Orders have been released to various suppliers for seven ship sets of materials for the fabrication phase. Ninety per cent of purchase orders have been released for the Installation phases of each vessel.
- There has also been a significant ramp-up of trades to support fabrication and installation. Eighty new trades and support staff have been employed as part of the projects to meet the schedule of delivery for HMAS Arunta.
- Fabrication started as scheduled on 1 June 2012, with the production of panels to produce the new Forward and After Masts. Equipment foundations and large sections of pipe work for the new cooling system, designed by BAE Systems to support the AN-SPS-49 and Phased Array Radar System.
- Fabrication will continue through to March 2013 and has an overlapping period with the removal of systems and equipment on-board HMAS Arunta, particularly focus for items required for installation in new locations on the Forward and After Masts.
- Since awarding of the ASMD Follow On contract, BAE Systems has mobilised an Integrated Project Team. The key team members are located BAE Systems - Maritime Henderson site, close to the vessels on the hardstand, ensuring all members are up to date with progress and can deal with any issues quickly.
- To ensure the ASMD Follow On contract execution is successful, the ANZAC System Project Office sought and received approval to take Materials Control of each vessel undertaking the ASMD Capability upgrade. This enables BAE Systems to control and monitor the daily operations during the upgrade period and provides additional opportunities to meet the demanding schedule.