PACIFIC 2012

EXCLUSIVE INTERVIEW
Vice Admiral Ray Griggs AM, CSC, RAN
Chief of Navy

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BAE Systems, which was responsible for significant modifications to the lead ship HMAS *Perth* which successfully completed sea trials of its ASMD upgrade in June 2011, said work would begin on the balance of the fleet in late 2012 and would be completed in 2017. Announcing the program on 28 November 2011, Defence Minister Stephen Smith said the work would be worth between $600 million to $650 million. A separate announcement from BAE Systems, a member of the Anzac Ship Integrated Material Support Program Alliance along with Saab Systems and the Defence Materiel Organisation (DMO), said it had been awarded a $270 million contract for work on the program.

An additional 240 jobs will be created, 90 per cent of them at Henderson in Western Australia and 10 per cent at BAE Systems Williamtown yard.

RAN Captain Robert Elliott, DMO’s Project Director, Antiship Missile Defence until late November 2011, told ADM that tests in the course of last year included *Perth* handling eight targets inbound or on top at the same time, travelling at 560 plus knots. This is a far cry from the single channel of fire provided by the existing CEROS200 fire control director, and a powerful endorsement of the selection in September 2005 of CEA Technologies’ Phased Array Radar (PAR) solution as the core of the SEA 1448 Phase 2 program to protect the Anzacs against current and future generations of anti-ship missile threats.

The PAR solution involves the CEAFAR E/F band active PAR and, slaved to CEAFAR, the associated CEAMOUNT I/J band multi-channel active phased array missile illuminator which produces electronically steered beams to provide target illumination and uplink support for the semi-active radar homing Evolved Seasparrow Missile (ESSM).

Project Sea 1448 Phase 2A was approved in 2003 and comprised enhancing the Saab Systems 9LV 453 combat management system (CMS) aboard the Anzacs to Mk3E standard and installing a SA-GEM VAMPIR infrared search and tracking system (IRST) to improve situational awareness and threat alert in littoral environments.

Phase 2B fuses together the CEAFAR and CEAMOUNT systems, VAMPIR, a new Kelvin Hughes SharpEye navigation radar, and the 9LV Mk3E CMS which integrates these capabilities into a single, flexible whole.

Although Phase 2B’s original baseline was to provide one additional radar director for a second ESSM channel of fire along with the installation of two very short-range air defence systems (VS-RADS), the combination of CEAFAR and CEAMOUNT has seen a startling increase in capability.

Following trials off Australia and Hawaii that confirmed the exemplary performance against high-speed, agile targets of the Anti-Ship Missile Defence (ASMD) upgrade installed on HMAS *Perth*, this radical enhancement to capability is now to be extended to the RAN’s seven other Anzac class frigates.
Extensive ASMD modifications to HMAS Perth were completed by BAE Systems Australia in November 2010 at the maritime Common User Facility at Henderson in Western Australia. These included installation of the six-face CEAFAR radar in a distinctive cupola atop a new aft mast superstructure, with the four-face CEAMOUNT placed immediately below it.

“We had relocated the SPS-49 three-dimensional air defence radar approximately five metres higher on the aft mast and one of the subsequent tests was to determine whether it would withstand the rigours of the sea which of course it did, we’ve had it in Sea State 7 with the green coming over the bridge,” CAPT Elliott commented.

Prior to the modifications HMAS Perth was baselined to ensure buoyancy and balance. An additional 100 tonnes of lead was placed in the keel, cross-connect tanks were changed and the quarterdeck area was enclosed.

“The ship now rides very nicely, it’s well within the stability margin and we can still add another 25 per cent of top weight,” CAPT Elliott said.

Two months of sea trials which began off the West Australian coast last February worked up to final tests in which the CMS was dealing simultaneously with eight targets.

“We had to engage all of these targets within a specific timeframe and the heights varied, although none were lower than 500 ft because of the safety perspective,” CAPT Elliot commented. “I managed to get an F/A-18 to do 1,000 knots. It had to be at 40,000ft and 50 miles out at sea, but the sonic boom was still heard inland and reported on the news.”

The ability of the CMS to successfully handle eight missiles in the air at the same time flowed from the first trial of Stage 2 ASMD software running in the background to the integrated continuous wave illumination. Stage 1 software provides four channels of fire from the PAR suite and one from the existing CEROS 200 director.

“That happens when we have more than five missiles in the air at any one time and that again is a first for Australia. We delivered Stage 1 in 2009 and Stage 2 is just a software change.

“We completed the critical design review in September and the first live demonstration will be around June when we demonstrate the ability to communicate with the ESSM and uplink information.”

“You’ve got to remember that this is not just about self-protection of the ship, it’s also to provide additional screen protection to the LHDs that are coming online,” CAPT Elliott outlined to ADM.

Engaging anti-ship missiles launched in salvo would rapidly deplete the 32 ESMs carried in the Anzacs’ Mk 41 vertical launch system. Space for an additional Mk 41 beside the existing system was part of the original Anzac build but, as reported in this edition’s From the Source interview, Chief of Navy Ray Griggs thinks this option is unlikely to be taken up.

The ESM firing which took place on 8 May in the Jervis Bay area was intended to prove CEAMOUNT’s ability to successfully provide an engagement, rather than trial a full tactical scenario.

Delays in replacing the Kalkara target missile under Joint Project 66 meant Navy had to shop around for an alternative, eventually settling on Air Affairs’ Phoenix Jet drone. Utilising the full capabilities of Stage 1 software, the ESSM was successfully guided to the two-metre wingspan drone flying at a height of 1,000 ft, thus completing sea acceptance testing.

The following month saw the overall ASMD capability stressed tactically in a realistic operational scenario when HMAS Perth accompanied HMAS Sydney to the US Pacific Missile Range Facility off Hawaii.

“The idea was that we would utilise the targets being used by HMAS Sydney for her SM-2 acceptance testing and operational test and evaluation firings,” said CAPT Elliott.

“So we had both ships out there and we were tracking USN targets with the radar
cross section of a typical missile, using the (ASMD) system and engaging with simulated missiles.

“All the engagements we undertook were successful based on the system modelling, and all the targets were flying at a height significantly less than the 1,000ft that we used in the 8 May ESSM firing.”

HMAS Perth then utilised ASMD operationally for the first time as part of Exercise Talisman Sabre, defending against air attacks in the littoral environment.

“DMO has done a lot of work over the past four years with Navy who take us through the tactical scenarios, how to utilise theIRST system in those environments, but you can only do so much when environments are simulated and that’s exactly what these exercises are for,” CAPT Elliott said.

He anticipated the operational test and evaluation period which effectively began off Hawaii last June would continue through to late this year.

Although Phase 1B had originally included the installation of two VSRADS, DSTO modelling had determined that the PAR/ESSM combination, including the additional capability that will be provided by the Block 2 ESSM that is now under development, would be a superior option.

A Phalanx close-in weapon system, similar to those deployed on the two New Zealand Anzacs, could easily be fitted should it ever be required.

Shortly before ADM went to print, the ASMD project was removed from the Projects of Concern, a listing understood to have been driven as much by the additional costs involved in redesign of the fore and aft masts and other areas as by concern about the ability of the cutting edge PAR technology to fulfil its promise.

At a time in which a number of defence programs have been receiving a bad press, Sea 1448 Ph2B is generally considered to offer an excellent example of cooperative program management.

This is attributed by CAPT Elliott both to the good relationship between participants, and to the deep knowledge of the Anzac class.

“We understand the vessel, we have the intellectual property (IP), we understand the combat system, and when it comes to combat system integration it always pays to have an OEM (original equipment manufacturer) that has IP that you understand and manipulate.

“Having CEA available to us provides the flexibility that we need, and BAE Systems has delivered on this project because they’ve seen the strategic importance of this capability.”

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