HMAS Perth a test case for ASMD

The Anzac class Anti-Ship Missile Defence (ASMD) program is well underway with HMAS Perth alongside in Henderson, WA having had her two masts removed in February for the extensive upgrade program. Phases 2A and B of SEA1448 are not just about radars; they will effect 280 of the 336 compartments aboard the ship.

THE SPS-49 radar has been removed in preparation for the new masts that will tower over the ship, due to the elevation requirements of the new radars. HMAS Perth is the first Anzac to go through the process, acting as a test bed for the capability that will be rolled out to other ships as the program reaches various milestones.

"It's not just the radars that are being upgraded here," Richard Turpin, BAE Systems WA-based ASMD production manager, told ADM. "We are taking off 36 tonnes of equipment and replacing it with only 14 tonnes."

This includes taking off all the copper wiring and replacing it with blown fibre-optic cabling, replacement of the cooling system with a BAE Systems-designed and manufactured chilled water system for the radars, and upgrades to the heating and ventilation systems.

"The fibre-optic backbone also makes future upgrades easier," Jason Beer, BAE Systems general manager of through life support, told ADM. "If they need to run more fibre through the backbone, they can blow it through the existing structure, rather than having to break through the integrity of the watertight structures."

The operations room also gets a makeover, with new consoles, displays and communications equipment creating a much more ergonomic system that facilitates better communication in the space. BAE Systems, Saab and the DMO did extensive modelling and mock-ups for the RAN to get a sense of how the room would operate with the Saab 9LV Mk3E Combat Management System (CMS) in place.

Key improvements to upgrade sensors and weapon systems in Phase 2A include:
- Installation of an infra-red search and track system (IRST) providing improved detection and indication of low-level aircraft and anti-ship missiles when close to land;
- Improvements to the existing fire control radar to increase the detection and engagement range against anti-ship missiles; and
- Improvements to the command and control system to shorten the time between detection and engagement of anti-ship missiles and to improve the overall tactical information flow in the operations room.

Key improvements to upgrade sensors and weapons in Phase 2B include:
- The CEAFAF active phased array radar system being developed by CEA Technologies, an Australian company based in Fyshwick, ACT, will offer significant enhancements over conventional radars to provide target indication and tracking of supersonic anti-ship missiles; and
- The CEAMOUNT active phased array radar system, also being developed by CEA, will be fitted to provide mid-course guidance and terminal illumination for the Evolved Sea Sparrow Missile. This will deliver multiple channels of fire, and enable more than one missile to be controlled in flight.

Both CEAFAF and CEAMOUNT have undergone rigorous testing, for both capability and integration elements, by the DMO, DSTO and CEA. Given the powerful nature of the system, land-based testing was a distinct challenge, but the system passed its milestone at the end of last year, making it ready for installation onto HMAS Perth.

Contract arrangements

The CEA Technologies equipment is supplied directly to the DMO who then pass on the ship sets, as Government Furnished Equipment (GFE), to BAE Systems at their Henderson yard in WA.

"This is not a typical GFE arms length arrangement," Beer told ADM. "We work closely with DMO, Saab and CEA to ensure the program remains aligned and issues are resolved across all parties."

A massive structural part of the upgrade is the installation of a new multi-faceted mast to incorporate the CEA equipment. Again, the project team have used mock-ups and modelling to find the best solution, with the old test rig right next to
the new mast in the WA shop.

"The mast has no right angles," Beer said. "The shape itself [a hexagonal design] at the top of the mast is dictated by the need to have the six phased array radar faces equally spaced around 360 degrees of the ship, giving the system maximum coverage."

While there are no CEA people currently on site, they will be on hand during the planned customer sea trials in February next year - but BAE Systems expects to have the bulk of the work on HMAS Perth done by September this year for trials during the last quarter of the year. Another important milestone for the project will come mid-year, with approval to commence procurement of materials for ships 2 and 3, predominantly around the aluminium supply for the masts. This will then be followed by a December milestone, based on sea trials of HMAS Perth, to begin the manufacture of the masts for ships 2 and 3.

The aim is to upgrade the entire class by 2016; ASMD project director RAN Captain Rob Elliott told ADM last year and that all the dockyard work would be done at the Common User Facility in Henderson, WA.

Workforce
Given that some of the WA workforce is on loan from BAE Systems' Williamstown yard where the ships were built, there is a sense of familiarity for much of the management workforce in place.

"Because we've been doing a lot of the upgrade work on these ships through the Anzac Alliance and we have the original ship drawings, there's a higher level of awareness of the systems affected by ASMD," Beer said.

The project has created about 150 jobs for BAE Systems' WA site, with numerous flow-on effects for surrounding businesses. Given the progress of the Gorgon oil and gas project, which has the potential to strip the marine and defence business workforce of the Henderson-based yard over the coming 18 months, the company is keen to keep that skilled workforce in place between ships.

"The lack of continuity between ship 1 and 2 is a concern," Beer confirmed to ADM. "Essentially we go from a full production team into a gap while the Navy prove that the upgraded ship performs to their required standards. We have to try and find the right balance between our in-house staff and contracted services in the ramping up and down of the program. But ASMD is a great project and we have a lot of people that enjoy the kind of work that we offer."