Project Data Summary Sheet[146]

Project Number	**SEA 1448 Phase 2B**
Project Name	**ANZAC ANTI-SHIP MISSILE DEFENCE**
First Year Reported in the MPR	2009-10
Capability Type	Upgrade
Acquisition Type	Developmental
Capability Manager	**Chief of Navy**
Government 1st Pass Approval	Nov 03
Government 2nd Pass Approval	Sep 05
Total Approved Budget (Current)	$678.6m
2016-17 Budget	**$42.4m**
Project Stage	Initial Materiel Release
Complexity	ACAT I

Section 1 – Project Summary

1.1 Project Description

The Anti-Ship Missile Defence (ASMD) upgrade SEA 1448 Phase 2 project will provide the ANZAC Class Frigates with an enhanced level of self-defence against modern anti-ship missiles.

There are two sub-phases of SEA 1448 Phase 2. Phase 2B of the ASMD Project, will introduce an indigenous, leading edge technology, phased array radar (CEAFAR) and missile illuminator (CEAMOUNT) collectively referred to as the Phased Array Radar (PAR) System. The PAR System delivers enhanced target detection and tracking that allows Evolved Sea Sparrow Missiles to engage multiple targets simultaneously. A new dual ship-set I-Band Navigation radar will coincidentally be provided under this Phase to replace the navigation function performed by the Target Indication Radar, at the same time replacing the obsolescent Krupp Atlas 9600.

1.2 Current Status

This Project had been a Project of Concern since June 2008, but was removed in November 2011 as part of the Real Cost Increase (RCI) decision made by Government in November 2011.

Cost Performance

In-year

At 30 June 2017 the project has an underspend of $4.9m. This is due to:

Follow on Contract (FON) - BAE Systems Australia $2.2m efficiencies and risk reduction reported and realised. (50% of this will be realised as gain share at the financial completion of the project.)

Phased Array Radar Production – CEA Technologies Pty Ltd savings against the earned value elements of the contract and minor slippage totalling $1.3m

Other contracts - inability to engage contractors and minor slippage totalling $1.4m.

Project Financial Assurance Statement

As at **30 June 2017** project SEA 1448 Phase 2B has reviewed the approved scope and budget for those elements required to be delivered by the project. Having reviewed the current financial and contractual obligations of the project, current known risks and estimated future expenditure, Defence considers, as at the reporting date, there is sufficient budget remaining for the project to complete against the agreed scope.

Contingency Statement

The project has **recovered** contingency in the financial year primarily **through finalising First of Class pain/gain share**

146 Notice to reader

Forecast dates and Sections: 1.2 (Materiel Capability Delivery Performance), 1.3 (Major Risks and Issues), 4.1 (Measures of Materiel Capability Delivery Performance), and 5 (Major Risks and Issues) are excluded from the scope of the ANAO's review of this Project Data Summary Sheet. Information on the scope of the review is provided in the *Independent Assurance Report* by the Auditor-General in **Part 3** of this report.

adjustments at lower than expected amounts. Contingency has been applied to cover remaining pain/gain share adjustments, dockyard facilities costs and training facility costs.

Schedule Performance

Based on the revised acquisition strategy approved by Government in July 2009, the systems being delivered in Phase 2B are largely on schedule. With the RCI for Phase 2B approved for the follow on ships 2-8 in November 2011, there is now a 55 month variance to the original approved date for Final Operational Capability (FOC) for this phase of the project. During 2014-15, due to pressures from the large sustainment program of work, a revised schedule was developed for ships four onwards. Recent achievements include the Materiel Release (MR) of the fourth ship HMAS Warramunga in October 2015, and the fifth ship. HMAS Ballarat the fifth ship in May 2016. HMAS *Parramatta* the sixth ship **was completed in January 2017.** HMAS *Toowoomba* the seventh ship **was completed in May 2017 and** the final ship, HMAS *Stuart* **is progressing well with completion expected in September 2017**. The project remains on track to deliver Final Operating Capability by October 2017.

Materiel Capability Delivery Performance

Initial Materiel Release (IMR) was claimed for Stage 1 Capability on HMAS *Perth* on 24 June 2011. The Chief of Navy formally provided Initial Operational Release (IOR) for ASMD upgrade capability delivered to HMAS *Perth* and its associated support systems in 16 August 2011. The Project has now completed Operational Test & Evaluation (OT&E) for the final Stage 2 capability. Initial Operational Capability (IOC) was achieved in September 2015.

Note

The capability assessments and forecasts by the project are not subject to the ANAO's assurance review.

1.3 Project Context

Background

The need for an ASMD capability in the Royal Australian Navy's (RAN) surface fleet was first foreshadowed in the 2000 Defence White Paper.

SEA 1448 Phase 2B is the final Phase of the ANZAC ASMD Program, where the addition to the Class of the phased array radar technology is being undertaken by the Australian Company CEA Technologies and the overall integration into the ANZAC Class is being performed by the ANZAC Alliance (Commonwealth plus BAE Systems (previously Tenix) and Saab Systems).

SEA 1448 Phase 2B was approved by Government in September 2005. SEA 1448 Phases 2A (the initial phase of the ASMD Project which is procuring the combat management system hardware and the infra-red search and track capability) and 2B are being managed as a confederated ASMD Project due to their common systems engineering disciplines, schedules and risks. Due to its leading edge and developmental technology, Phase 2B, was considered to be a high risk phase. Originally planned for installation into all eight ANZAC Class ships under a single contract, a further review in 2007 of the technical risks associated with the introduction of the leading edge radar led Government in August 2009 to revise the acquisition strategy to a single ship installation. This strategy allows the project to prove this capability at sea before seeking Government approval to commence installation into subsequent ships. The lead ship, HMAS *Perth,* successfully underwent acceptance testing between October 2010 and June 2011 with the Chief of Navy accepting IOR in August 2011. IOC was achieved in September 2015.

Uniqueness

The phased array radar component of the ASMD Project is highly developmental and has not previously been fielded in this form before, although the system components are fourth generation derivatives of fielded CEA systems. The RAN is the first to operate a ship with the Australian designed and manufactured CEA Technologies low power active Phased Array Radar System.

Major Risks and Issues

The major risks and issues for SEA 1448 Phase 2B are:

- That indices used in the prime contract, particularly labour rates, may exceed current predictions. **This risk has now been retired;**
- An inability to resource the ASMD Project correctly (includes availability, conflicts, personnel, training and quality (Commonwealth, CEA, ANZAC IMS, Industry, Test and Trials);
- **A chance of** unplanned work being activated during an ASMD upgrade period, **predominantly through the concurrent planned maintenance activities.**
- **A chance that inadequate tracking and management of assets and supplies causes loss of stock;**
- **Budgeted Cost Model and Assets Under Construction are not correctly maintained and rolled out; and**
- **Obsolescence of Kelvin Hughes navigation radar necessitates replacement before the specified date.**

Other Current Sub-Projects

SEA 1448 Phase 2A – This initial phase of the ASMD Project is to upgrade all eight of the ANZAC Class Ship's existing ANZAC Class Combat Management Systems (CMS) and fire control systems, and install an Infra-Red Search and Track (IRST) System which will provide improved detection of low level aircraft and anti-ship missiles when the ship is close to land.

SEA 1448 Phase 4A – This Phase complements the ASMD Upgrade by delivering a contemporary Electronic Support Measures (ESM) system. This Phase is being managed through Electronic Systems Division (ESD).

Note

Major risks and issues are excluded from the scope of the review.

Section 2 – Financial Performance

2.1 Project Budget (out-turned) and Expenditure History

Date	Description	$m		Notes
	Project Budget			
Sep 05	Original Approved		248.8	
Mar 06	Real Variation – Transfers	155.4		1
May 06	Real Variation – Transfers	(6.7)		2
Nov 11	Real Variation – Scope	214.7		3
			363.4	
Jul 10	Price Indexation		76.1	4
Jun 17	Exchange Variation		(9.6)	
Jun 17	**Total Budget**		678.6	
	Project Expenditure			
Prior to Jul 16	Contract Expenditure – CEA Technologies (PAR Production)	(183.4)		5
	Contract Expenditure – BAE Systems Australia (Follow On Ships)	(155.2)		
	Contract Expenditure – SAAB Systems Pty Ltd (First of Class)	(76.9)		
	Contract Expenditure – BAE Systems Australia (First of Class)	(59.8)		
	Contract Expenditure – CEA Technologies (P3 Contract)	(57.6)		6
	Contract Expenditure – ICWI Membership	(19.7)		
	Other Contract Payments / Internal Expenses	(47.2)		7
			(600.0)	
FY to Jun 17	Contract Expenditure – BAE Systems Australia (Follow On Ships)	(23.7)		
	Contract Expenditure – CEA Technologies (PAR Production)	(6.1)		5
	Contract Expenditure – BAE Systems Australia (First of Class)	(4.1)		
	Contract Expenditure – SAAB Systems Pty Ltd (First of Class)	(1.9)		
	Other Contract Payments / Internal Expenses	(1.6)		7
			(37.5)	
Jun 17	**Total Expenditure**		(637.4)	
Jun 17	**Remaining Budget**		41.2	

Notes	
1	$155.4m transferred from SEA 1448 Phase 2A after Government agreed that initial Very Short Range Air Defence (VSRAD) was to be replaced with the PAR System from CEA.
2	Transfer to DSTO (Maritime Operations Division) for phased array radar risk mitigation activities in line with original Government approval in September 2005.
3	RCI of $214.7m approved for the follow on ships 2-8 in November 2011.
4	Up until July 2010, indexation was applied to project budgets on a periodic basis. The cumulative impact of this approach was $71.0m. In addition to this amount, the impact on the project budget as a result of out-turning was a further $5.1m having been applied to the remaining life of the project.
5	This is the production contract for the delivery of the first PAR System into HMAS *Perth* (lead ship). Following the approval of an RCI in November 2011, options were exercised to increase the scope to the remaining seven ships and spare system. In order to manage acquisition obsolescence of phased array radar components and retention of the strategic workforce related to the phased array radar, this contract also included forward component buys.

6	(P3 = Preliminary Phased Array Radar Program); This contract was officially closed in April 2010 and was aimed at development and initial production of the first PAR System.
7	Other expenditure comprises: operating expenditure, short term contractors, consultants and other capital expenditure not attributable to the aforementioned top five contracts and minor contract expenditure.

2.2A In-year Budget Estimate Variance

Estimate PBS $m	Estimate PAES $m	Estimate Final Plan $m	Explanation of Material Movements
38.7	48.8	42.4	PBS - PAES: The estimate variation of $10.1m is mainly due to slippage of payments from 2015-16 to 2016-17 and a small amount of costs which were not previously estimated. PAES - Final Plan: The ($6.4m) variance is predominantly due to the reduction in scope of the Phased Array Radar Contract with CEA Technologies $0.8m, a further reduction in forecast estimate at completion for the Follow On Contract of $3.6m, final pain share reconciliation on the FOC Contract indicated a $1.5m reduction in pain share requirement and $0.6m reduction in Common User Facility (Henderson Ship Yard) costs (other ASMD Prod Costs) due to the contracted price being less than previously estimated.
Variance $m	10.1	(6.4)	Total Variance ($m): 3.7
Variance %	26.2	(13.1)	Total Variance (%): 9.6

2.2B In-year Budget/Expenditure Variance

Estimate Final Plan $m	Actual $m	Variance $m	Variance Factor	Explanation
		(3.5)	Australian Industry	The variance to budget is due to:
			Foreign Industry	
			Early Processes	
		(1.4)	Defence Processes	FON - BAE $2.2m Efficiencies and risk reduction reported and realised. (50% of this will be realised as gain share at the financial completion of the project.)
			Foreign Government Negotiations/Payments	
			Cost Saving	
			Effort in Support of Operations	PAR Production – CEA savings against the earned value elements of the contract and minor slippage totalling $1.3m.
			Additional Government Approvals	
42.4	37.5	(4.9)	**Total Variance**	
		(11.7)	**% Variance**	Other contracts - inability to engage contractors and minor slippage totalling $1.4m.

2.3 Details of Project Major Contracts

Contractor	Signature Date	Price at		Type (Price Basis)	Form of Contract	Notes
		Signature $m	30 Jun 17 $m			
BAE Systems Australia (First of Class)	Jul 05	2.1	63.9	Variable	Alliance	1, 2
SAAB Systems Pty Ltd (First of Class)	Jul 05	3.1	78.8	Variable	Alliance	1
CEA Technologies (P3 Contract)	Dec 05	8.9	57.6	Variable	ASDEFCON	1
CEA Technologies (PAR Production)	Dec 08	16.0	193.3	Variable	ASDEFCON	1
BAE Systems Australia (Follow on Ships)	Jan 12	164.9	183.0	Variable	Alliance	1

Notes

1	Contract value as at 30 June 2017 is based on actual expenditure to 30 June 2017 and remaining commitment at current exchange rates.
2	Initially contracted to Tenix Defence prior to their sale to BAE Systems Australia in 2008.

Contractor	Quantities as at		Scope	Notes
	Signature	30 Jun 17		
BAE Systems Australia (First of Class)	0	2	Research and Development and Ship 1 system	
SAAB Systems Pty Ltd (First of Class)	0	2	Research and Development and Ship 1 system.	
CEA Technologies (P3 Contract)	1	2	Phased array radar developmental systems	1
CEA Technologies (PAR Production)	1	9	PAR Systems for Ship 1 - 8 and spare system	2

BAE Systems Australia (Follow on Ships)	7	7	Ships 2-8 Installation	
Major equipment received and quantities to 30 Jun ~~16~~17				
Equipment has been delivered into store and is being appropriately maintained until required by Phase 2B for its installation. Installation has been completed for First Of Class ship, HMAS *Perth*, HMAS *Arunta,* HMAS *ANZAC,* HMAS *Warramunga,* HMAS *Ballarat*, **HMAS *Parramatta* and HMAS *Toowoomba*.**				

Notes	
1	(P3 = Preliminary Phased Array Radar Program); This contract was officially closed in April 2010 and was aimed at development and initial production of the first PAR System.
2	This is the production contract for the delivery of the first PAR System into HMAS *Perth* (lead ship). Following the approval of an RCI in November 2011, options were exercised to increase the scope to the remaining seven ships and spare system. In order to manage acquisition obsolescence of phased array radar components and retention of the strategic workforce related to the phased array radar, this contract also included forward component buys.

Section 3 – Schedule Performance

3.1 Design Review Progress

Review	Major System/Platform Variant	Original Planned	Current Planned	Achieved /Forecast	Variance (Months)	Notes
System Requirements	Mk3E Combat Management System/Phased Array Radar – Stage 1 (Requirements Review)	Mar 06	N/A	May 06	2	1
	Mk3E Combat Management System – Stage 2 (Requirements Review)	N/A	N/A	Aug 09	N/A	1
	Mk3E Combat Management System/Phased Array Radar – Stage 1 (Functional Review)	Jun 06	N/A	Aug 06	2	1
Preliminary Design	Mk3E Combat Management System/Phased Array Radar Preliminary Design Review	Dec 06	N/A	Aug 07	8	1
	ASMD Shore Facilities (HMAS *Stirling*)	N/A	N/A	Aug 08	N/A	
Critical Design	Mk3E Combat Management System (Phased Array Radar integration) - Stage 1 Critical Design Review – Part 2	Dec 07	N/A	Aug 08	8	1
	Mk3E Combat Management System - Stage 2 Critical Design Review	Nov 10	Sep 11	Sep 11	10	2
	ASMD Shore Facilities (HMAS *Stirling*)	N/A	N/A	Dec 08	N/A	
	Phased Array Radar	Oct 07	N/A	Oct 07	0	

Notes	
1	Variance in design reviews is directly related to the change of acquisition strategy (movement from an eight ship program to a single ship program) or delay in initial contract award for phased array radar system.
2	Variance in Stage 2 Critical Design Review (CDR) date was as a result of delays in finalising Defence's requirements in the Software update. This was completed in April 2011 with CDR appropriately rescheduled. There was no impact to final Stage 2 software release date.

3.2 Contractor Test and Evaluation Progress

Test and Evaluation	Major System/Platform Variant	Original Planned	Current Planned	Achieved /Forecast	Variance (Months)	Notes
• Test Readiness Review	HMAS *Perth* with upgraded ASMD System (Mk3E Combat Management System/Phased Array Radar System/Navigation Radar System - Harbour Phase)	Dec 08	Aug 10	Aug 10	20	1
Acceptance (Initial Operational Capability)	HMAS *Perth* with upgraded ASMD System (Mk3E Combat Management System/Navigation Radar System)	Dec 09	Nov 13	Sep 15	69	2

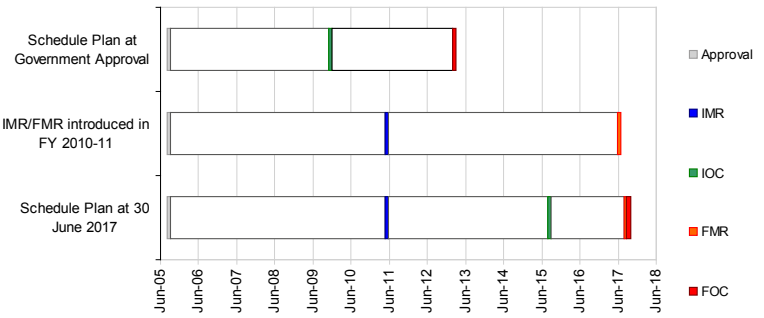
Notes	
1	Variance in both the test readiness review and acceptance of the first upgraded ASMD ship is directly related to the change of acquisition strategy and movement from an eight ship program to a single ship program.
2	Initially the variance in the acceptance of the first upgraded ASMD ship was directly related to the change of acquisition strategy and movement from an eight ship program to a single ship program. As part of the RCI process it was agreed by Navy, the then Capability Development Group and the then Defence Materiel Organisation to move IOC until after PAR had been proven against Supersonic Targets. IOC documentation was submitted to Navy in July 2014 and Capability Manager endorsement of IOC was achieved in September 2015.

3.3 Progress Toward Materiel Release and Operational Capability Milestones

Item	Original Planned	Achieved/Forecast	Variance (Months)	Notes
Initial Materiel Release (IMR)	N/A	Jun 11	N/A	
Initial Operational Capability (IOC)	Dec 09	Sep 15	69	1
Final Materiel Release (FMR)	Jul 17	Oct 17	3	2
Final Operational Capability (FOC)	Mar 13	Oct 17	55	3

Notes	
1	Variance was directly linked to updated Materiel Acquisition Agreement which moved IOC until after Phased Array Radar System had been proven against Supersonic Targets.
2	Variance is due to approval of ships 2-8 by Government.
3	Variance is directly linked to the change of acquisition strategy - movement from a one plus seven ship program to an eight ship program.

Schedule Status at 30 June 2017

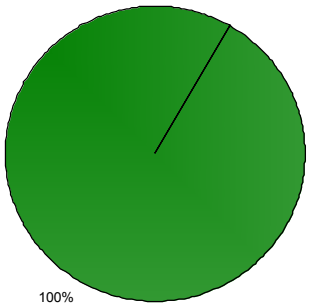


Note
Forecast dates in Section 3 are excluded from the scope of the review.

Section 4 – Materiel Capability Delivery Performance

4.1 Measures of Materiel Capability Delivery Performance

Pie Chart: Percentage Breakdown of Materiel Capability Delivery Performance



Green:

The Project is meeting capability requirements as expressed in the suite of Capability Definition Documentation and in accordance with the requirements of the relevant Technical Regulatory Authorities.

Amber:

N/A

Red:

N/A

Note
This Pie Chart represents Defence's expected capability delivery. Capability assessments and forecast dates are excluded from the scope of the review.

4.2 Constitution of Initial Materiel Release and Final Materiel Release

Item	Explanation	Achievement
Initial Materiel Release (IMR)	Provisional acceptance of the ASMD upgraded HMAS *Perth*.	Achieved
Final Materiel Release (FMR)	Acceptance of all ASMD upgraded ships and associated supplies, with final ship being, HMAS *Stuart*, scheduled for October 2017.	Not Yet Achieved

Section 5 – Major Risks and Issues

5.1 Major Project Risks

Identified Risks (risk identified by standard project risk management processes)	
Description	Remedial Action
There is a risk that indices used in the prime contract, particularly labour rates, may exceed current predictions.	Contingency was applied in the previous year to cover projected escalation and outcomes have remained in line with the projections. This risk has been retired.
There is a chance of unplanned work being activated during an ASMD upgrade period such as emergent work arising from planned ASMD installation activities, other maintenance activities and unplanned work scheduled during the ASMD installation work period.	The project and ANZAC SPO engineering group are actively managing the introduction of additional work packages into the ASMD upgrade period, with priority on maintaining the approved ASMD schedule. This risk has been downgraded to medium due to the final ship commencing trials.
Emergent Risks (risk not previously identified but has emerged during 2016-17)	
Description	Remedial Action
There is a chance that inadequate tracking and management of assets and supplies causes loss of stock.	Working groups and dedicated staff have been assigned to identify and manage any asset and supply losses by transferring or purchasing additional supplies as required.

5.2 Major Project Issues

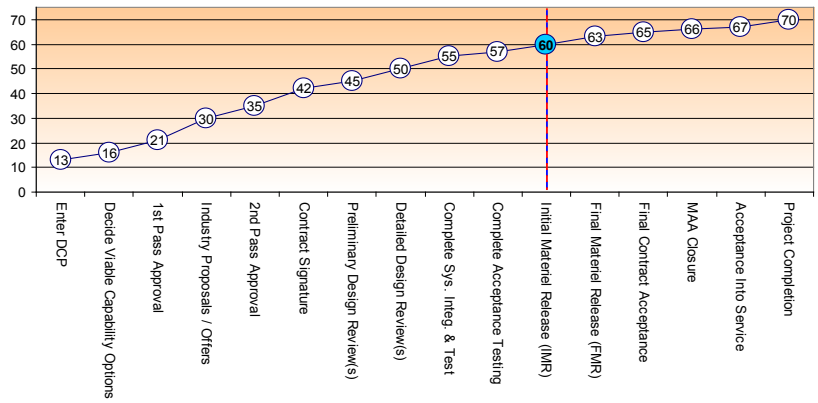
Description	Remedial Action
Inability to resource the ASMD Project correctly (includes availability, conflicts, personnel, training and quality (Commonwealth, CEA, ANZAC IMS, Industry, Test and Trials).	Planning of resource profiles against known constraints and schedules using close liaison with Navy through ANZAC Systems Program Office (SPO), and with our key industry participants.
Budgeted Cost Model (BCM) and Assets Under Construction (AUC) are not correctly maintained and rolled out.	Contingency is expected to be utilised to correct the shortage of experienced specialist staff required to manage the BCM and AUC tasks.
Obsolescence of Kelvin Hughes navigation radar necessitates replacement before specified date.	Contingency is expected to be utilised to correct the inadequate supportability period following determination of best replacement or update option.

Note
Major risks and issues in Section 5 are excluded from the scope of the review.

Section 6 – Project Maturity

6.1 Project Maturity Score and Benchmark

Maturity Score		Attributes							
		Schedule	Cost	Requirement	Technical Understanding	Technical Difficulty	Commercial	Operations and Support	Total
Project Stage	Benchmark	10	8	8	8	9	8	9	60
Initial Materiel Release	Project Status	8	8	9	9	9	8	9	60
	Explanation	• **Schedule:** Schedule is mature and there remains one further ship to upgrade. • **Requirement:** Based on the completion of OT&E, the requirements of Phase 2B are clearly understood. • **Technical Understanding:** Successful OT&E completed in August 2013.							



2015-16 MPR Status - - - -	2016-17 MPR Status - - - -

Section 7 – Lessons Learned

7.1 Key Lessons Learned

Project Lesson	Categories of Systemic Lessons
Ensure that technically complex developmental projects that have high levels of risk as part of the new system or integration of the new system into existing systems, demands that a prototype (lead platform) be agreed up-front and used for proving the capability before agreeing to additional platforms.	First of Type Equipment
Adequate communication between, and engagement of, critical stakeholders to ensure that a common understanding of Project status is maintained.	Governance

Section 8 – Project Line Management

8.1 Project Line Management in 2015-16

Position	Name
Division Head	RADM Adam Grunsell, RAN
Branch Head	CDRE Steve Tiffen, RAN
Project Director/Manager	Mr Michael Welsh (Acting to Sep 16) Mr Ian MacKinnon (Sep 16–current)