

PDSS Data Summary Sheet¹⁴⁰

Project Number	SEA 1439 Phase 4A
Project Name	COLLINS REPLACEMENT COMBAT SYSTEM
First Year Reported in the MPR	2007-08
Capability Type	Upgrade
Acquisition Type	Australianised MOTS
Capability Manager	Chief of Navy
Government 1st Pass Approval	N/A
Government 2nd Pass Approval	Sep 02
Budget at 2 nd Pass Approval	\$455.3m
Total Approved Budget (Current)	\$450.5m
2017–18 Budget	\$1.0m
Project Stage	Initial Materiel Release
Complexity	ACAT IV



Section 1 – Project Summary

1.1 Project Description

The SEA 1439 Phase 4A Replacement Combat System (RCS) project was established to provide each of the six Royal Australian Navy (RAN) Collins Class submarines with an initial installation of the United States (US) Navy (USN) AN/BYG-1 Combat and Weapon Control System, minor improvements to the combat system augmentation sonar, and shore facilities for integration, testing and training. Shore based systems are located at the Submarine Training and Support Centre at HMAS *Stirling* (WA) and a reference laboratory in the US at the Naval Undersea Warfare Centre. The project required the development of system commonality between the RAN and USN.

1.2 Current Status

Cost Performance

In-year

The **overspend of \$0.8m** is due to difference between estimates and actual costs for work conducted by **Australian Submarine corporation (ASC Pty Ltd) on HMAS Collins**.

Project Financial Assurance Statement

As at 30 June 2018, project SEA 1439 Phase 4A 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 not applied contingency in the financial year.

Schedule Performance

Project submarine installations are consistent with the approved Materiel Acquisition Agreement (MAA) schedule; however, each installation is dependent on the Full Cycle Docking (FCD) program. Consequently, completion dates vary according to submarine availability. The RCS schedule has also been impacted by emergent work during each submarine docking. The final submarine installation **was completed** in 2018, following the decision to defer the HMAS *Collins* FCD, with Final Materiel Release (FMR) forecast for October 2018 (33 months behind schedule).

Materiel Capability Delivery Performance

CS04

140 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.

The RCS Project managed the development, installation and integration of the CS04 baseline. The installation in HMA Ships *Waller* and *Farncomb* was approved for Initial Operational Release (IOR) by Chief of Navy (CN) in May 2008 and September 2009 respectively. CN subsequently approved Operational Release (OR) of that baseline in December 2009. The capability delivered in HMA Ships *Waller* and *Farncomb* is consistent with that identified in the project requirement.

CS05

The RCS Project managed the development, installation and integration of the CS05 baseline. Installations and Harbour Acceptance Testing for the upgraded combat system baseline installed in HMA Ships *Dechaineux* and *Sheean* are complete. Sonar towed array trials scheduled for HMA Ships *Dechaineux* and *Sheean* were completed with OR of the Collins Towed Array Processor (CTAP) being awarded on 20 January 2011. IOR approval of the upgraded baseline as installed in HMAS *Dechaineux* occurred on 8 March 2011. OR of the CS05 baseline was achieved on 13 July 2016.

CS06

Installation of the upgraded baseline in HMAS *Rankin* was completed by the RCS Project in May 2014. The development and integration of this baseline is being managed by Sustainment.

Technical Insertion (TI)14

Installation in HMAS *Collins* was completed by the RCS Project in conjunction with the FCD program in June 2018. Note: This baseline adopts the new TI naming convention beyond CS06. Development, installation and integration of all further combat system upgrades is being managed by Sustainment.

Note

Forecast dates and capability assessments are excluded from the scope of the review.

1.3 Project Context

Explanation

Background

Risks associated with rapid technology change have been treated by adopting a project management strategy that aligns with the US continuous update program and its two-year update cycle.

The then standard acquisition approach was adapted to enable the project office to establish itself as prime contractor with a series of Integrated Project Teams working at various levels within Defence and industry. This role has required close collaborative relationships to be formed between Defence, the USN and industry partners in Australia and the US.

In July 2001 the Minister for Defence terminated the original tender process for the Collins Class RCS.

In September 2002 the Government approved the project based on the procurement of the following off-the-shelf sub-systems:

- the US Combat and Weapon Control sub-system, consisting of the Combat Control System and the Virginia Class Weapons Integration Panel, to be acquired by Foreign Military Sales (FMS);
- minor improvements to the sonar processing solution currently installed in HMA Ships *Sheean* and *Dechaineux* as part of the Combat System Augmentation initiative; and
- other system support infrastructure and project support.

The USN Combat and Weapon Control System is being supplied under an Armaments Cooperative Project (ACP) which provides for system upgrades developed on a bi-annual basis, whereas the Commonwealth is adopting every second baseline with a four year update cycle. This project provides one system baseline for the first two submarines and later baselines for the remaining four submarines. These initial baselines installed by the RCS Project will be upgraded at some later date as a sustainment activity.

Australian systems are provided under a combination of contracts. The main Australian contractors included ASC Pty Ltd, Raytheon Australia, Thales Australia and Sonartech Atlas Pty Ltd. Installation was undertaken in conjunction with SEA 1429 Phase 2 – Replacement Heavyweight Torpedo at locations in South Australia and Western Australia. Installation in all submarines was coordinated with the FCD program.

The combat system capability enhancement required a significant change to submarine infrastructure that could only be achieved during a major docking. Furthermore, to ensure the required submarine availability was not impacted adversely and to work within the existing workforce at ASC Pty Ltd, it was necessary to couple the installation program to the existing submarine docking program. Although there are significant benefits in coupling the RCS installation schedule to the submarine docking program, that coupling has dictated the delivery schedule of the RCS capability.

Uniqueness

The Commonwealth has undertaken the functions of a prime systems integrator. This role required the Commonwealth project team to manage and coordinate a number of separate contracts and ultimately the integration, installation and testing of the delivered products.

The Project is participating in a Joint Development Program with the USN to introduce hardware and software upgrades for Combat and Weapon Control System and implementing that evolving system baseline into the Collins combat system.

Major Risks and Issues

The project has retired or transferred all risks.

Other Current Sub-Projects

- **SEA 1439 Phase 3 Collins Class Submarine Reliability and Sustainability:** SEA 1439 Phase 3 is a program of upgrades to Collins Class platform systems to improve the Fleet's reliability, sustainability, safety and capability.

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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 02	Original Approved (Second Pass Approval)	455.3	
May 03	Real Variation – Transfer	(0.9)	1
Aug 04	Real Variation – Budgetary Adjustment	(0.8)	2
		(1.7)	
Jul 10	Price Indexation	56.5	3
Jun 18	Exchange Variation	(59.6)	
Jun 18	Total Budget	450.5	
	Project Expenditure		
Prior to Jul 17	Contract Expenditure – Raytheon Australia	(101.8)	4
	Contract Expenditure – US Government (FMS)	(79.3)	5
	Contract Expenditure – US Government (ACP)	(59.1)	6
	Contract Expenditure – Thales Australia	(26.9)	
	Contract Expenditure – Sonartech Atlas Pty Ltd	(26.8)	
	Other Contract Payments/Internal Expenses	(143.1)	7
		(437.0)	
FY to Jun 18	Other Contract Payments/Internal Expenses	(1.8)	8
Jun 18	Total Expenditure	(438.8)	
Jun 18	Remaining Budget	11.7	
Notes			
1	Transfer to the then Defence Science Technology Organisation (DSTO).		
2	Administrative savings harvest.		
3	Up until July 2010, indexation was applied to project budgets on a periodic basis. The cumulative impact of this approach was \$55.5m. In addition to this amount, the impact on the project budget as a result of out-turning was a further \$1.0m having been applied to the remaining life of the project.		
4	The previous Major Projects Report incorrectly classified \$0.1m of Raytheon expenditure as Other Contract expenditure.		
5	The FMS case value is \$79.3m (written back from \$143.9m - see Note 1 in Section 2.3 below). The supplies remaining under the FMS case would then be delivered under the ACP.		
6	The ACP is the main vehicle for supplying equipment and services for the Combat and Weapon Control hardware and software development.		
7	Other expenditure of \$143.1m includes an amount of \$53.09m to ASC Pty Ltd for platform design and installation; a total of \$33.6m on supplies and services provided by other Contractors, and \$10.2m to Engineering and Scientific Systems for engineering and testing support. The remaining \$46.3m of expenditure comprises operating expenditure, consultants, and contingency used in 2009-10.		
8	The amount of \$1.8m comprises of \$1.3m to ASC Pty Ltd and \$0.5m to Raytheon Australia for platform installation.		

2.2A In-year Budget Estimate Variance

Estimate PBS \$m	Estimate PAES \$m	Estimate Final Plan \$m	Explanation of Material Movements
2.4	0.8	1.0	PBS to PAES: The variance is due to the difference between estimates and actual costs for work conducted by ASC Pty Ltd on HMAS Collins.
Variance \$m	(1.6)	0.2	Total Variance (\$m): (1.4)
Variance %	(66.7)	25.0	Total Variance (%): (58.3)

2.2B In-year Budget/Expenditure Variance

Estimate Final Plan \$m	Actual \$m	Variance \$m	Variance Factor	Explanation
		0.8	Australian Industry	The overspend of \$0.8m is due to the difference between estimates and actual costs for work conducted by ASC Pty Ltd on HMAS Collins.
			Foreign Industry	
			Early Processes	
			Defence Processes	
			Foreign Government Negotiations/Payments	
			Cost Saving	
			Effort in Support of Operation	
			Additional Government Approvals	
1.0	1.8	0.8	Total Variance	
		80	% Variance	

2.3 Details of Project Major Contracts

Contractor	Signature Date	Price at		Type (Price Basis)	Form of Contract	Notes
		Signature \$m	30 Jun 18 \$m			
US Government (FMS)	Jun 03	143.9	79.3	Fixed	FMS	1, 6
Sonartech Atlas Pty Ltd	Jun 03	22.5	35.8	Variable	ASDEFCON Strategic	2, 6
Raytheon Australia	Aug 03	53.9	101.8	Variable	ASDEFCON Strategic	3, 6
Thales Australia	Oct 03	22.9	26.9	Variable	ASDEFCON Strategic	4, 6
US Government (ACP)	Nov 04	51.8	60.9	Fixed	ACP	5, 6
Notes						
1	Included on-going involvement in the Combat and Weapon Control hardware and software development process for the duration of the ACP. The FMS Case valued at \$143.9m was written back to \$79.3m with the introduction of the ACP.					
2	The Sonartech Atlas Pty Ltd contract value as at 30 June 2018 includes a Sustainment component of \$9.0m.					
3	Includes on-going involvement in the Combat and Weapon Control hardware and software development process for the duration of the ACP. This contract also provided for the integration of Electronic Chart Display Information System (ECDIS) master navigation into the combat system at a cost of \$2.8m which was not funded by SEA 1439 Phase 4A.					
4	The Thales Australia contract valued at \$27.3m was written back to \$26.9m following delivery of the final contracted supplies.					
5	The US Government (ACP) 30 June amount was reported as \$121.0m in previous MPRs (to 2012-13), however this figure included sources of funding other than SEA 1439 Phase 4A. SEA 1429 Phase 2 and Sustainment were the other contributors to the ACP costs. The Price Base at Signature has also been revised to reflect only SEA 1439 Phase 4A.					
6	Contract value as at 30 June 2018 is based on actual expenditure to 30 June 2018 and remaining commitment at current exchange rates, and includes adjustments for indexation (where applicable).					
Contractor		Quantities as at		Scope		Notes
		Signature	30 Jun 18			
US Government (FMS)		7	7	US Combat and Weapon Control sub-system		
Sonartech Atlas Pty Ltd		4	7	Sonar sub-system equipment		1
Raytheon Australia		7	7	Tactical System sub-systems and components		
Thales Australia		7	7	Scylla Sonar and associated sub-systems		
US Government (ACP)		7	7	US Combat and Weapon Control sub-system		
Major equipment received and quantities to 30 Jun 18						
Six RCS Ship Sets delivered. Installation of the RCS in all six submarines has been completed. Category 5 Sea Acceptance Testing completed. Engineering and maintenance arrangements established.						
Notes						

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1	The RCS project was funded originally for four Submarine Acoustic Transitory Event Processing System units. The in-service support organisation took advantage of an option in the RCS project acquisition contract with Sonartech Atlas Pty Ltd to replace the ageing Submarine Acoustic Transitory Event Processing System units fitted to the existing submarine combat system. Although the contract value was increased, the additional sets were not funded from project funds.
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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	Combat System	Nov 04	N/A	Nov 04	0	1
System Design	Combat System	May 05	N/A	May 05	0	1
Preliminary Design	20 Separate sub-systems or major components	Oct 03 – Oct 06	N/A	Nov 03 – Oct 06	1	1
Critical Design	20 Separate sub-systems or major components	Nov 03 – Apr 07	N/A	Nov 03 – Apr 07	0	1, 2
Notes						
1	The above data represents rolled up information as the project consists of many sub-systems each of which have independent Preliminary Design Review, Critical Design Review, or associated activities. Additionally, these system engineering activities were applied across two system baselines. As a result, there were many individual events within each of the above activities where the schedule was allowed to move provided the critical path for the delivery of capability was not impacted adversely. The critical path was based on the FCD program. Although some individual activities were ahead or behind schedule the project has maintained the critical path as defined by the FCD program. In some instances schedule slip has occurred as a result of project management intervention to delay finalisation of sub-system and major component design until the evolving US Combat and Weapon Control system baseline was mature. The project schedule has been re-baselined following significant events. To progress the Preliminary Design Review and Critical Design Review activity ahead of the US system development would have incurred significant cost. Preliminary Design Review and Critical Design Review slip has not impacted capability delivery because of the dependency on the FCD program to install the RCS equipment.					
2	Some sub-systems or major components have several Critical Design Reviews or US equivalent.					

3.2 Contractor Test and Evaluation Progress

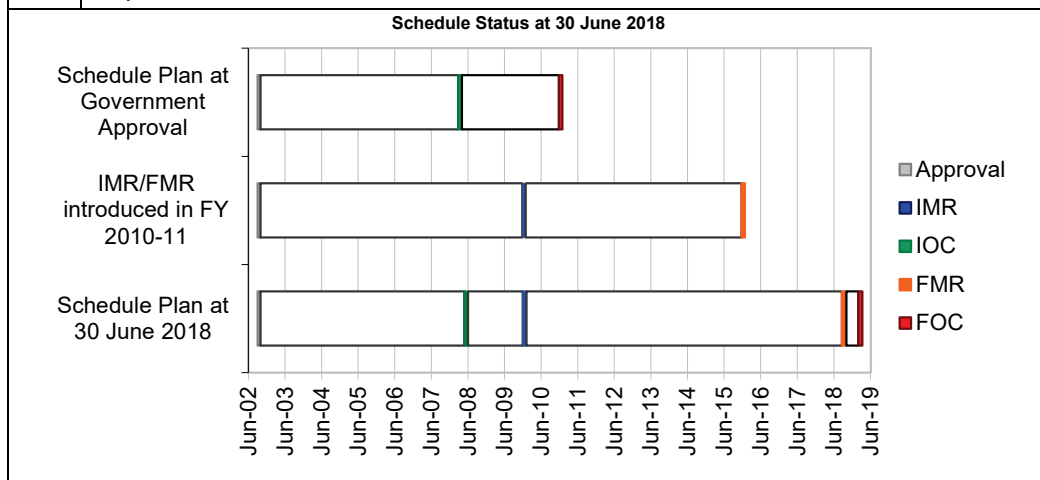
Test and Evaluation	Major System/Platform Variant	Original Planned	Current Planned	Achieved /Forecast	Variance (Months)	Notes
System Integration	Combat System - System Integration Test Phase 1-6	Jun 06 – Apr 08	N/A	Jun 06 – Apr 08	0	
	Combat System - Harbour Acceptance Trials Stage 1-3	Nov 06 – May 08	N/A	Nov 06 – May 08	0	
	Combat System - Sea Acceptance Trials Stage 1-2	Dec 07 – Jun 08	N/A	Dec 07 – Jun 08	0	
	Category 3 System Integration Testing Combat System CS05.00.01 (TI06/APB06)	Apr 09	N/A	Apr 09	0	
	Category 4 Harbour Acceptance Testing Combat System CS05.00 (TI06/APB06)	Nov 09	N/A	Dec 09	1	1
	Category 3 System Integration Testing Combat System CS05.01 (TI06/APB06)	Jan 09	N/A	Jan 09	0	
	Category 4 Harbour Acceptance Testing Combat System CS05.01 (TI06/APB06)	Feb 10	N/A	Feb 10	0	
	Category 5 Sea Acceptance Trials Combat System CS05.01 (TI06/APB06)	Apr 10	N/A	Aug 10	4	2, 3
Notes						
1	Combat System CS05 baseline Harbour and Sea Acceptance Trial tests were conducted in two stages to account for weather, submarine defects and support vessel defects. In general, the project test and evaluation program was carried out in conjunction with other post docking activities and the planned testing schedule has been impacted to some extent.					

2	<p>Combat System CS05.01 baseline Sea Acceptance Trials and associated shore based analysis were completed in August 2010. The variance for testing is due to HMAS <i>Dechaineux</i>'s FCD schedule delays and the need to complete additional testing of the Towed Array (TA) (previously delayed because of non project related equipment malfunction) and the ECDIS. The ECDIS and the TA increased the scope of the subsequent sea trials.</p> <p>The outcome of the CS05.01 trials including the ECDIS and TA were successful, with some minor trouble reports noted but not affecting capability. The CS05.01 System Design Certificate was issued 10 September 2010. CS05 Initial Materiel Certification for HMAS <i>Dechaineux</i> was achieved 22 September 2010. OR of the CS04 CTAP was awarded on 20 January 2011. CS05 IOR was awarded by CN on 8 March 2011. Additional testing of CS05 (TI06) minor software upgrades were conducted by the Project in 2010 and 2012. CS05 OR was awarded on 13 July 2016.</p>
3	<p>The CS05 Acceptance trials were the last acquisition related testing activity managed by the Project. All further development and testing of the CS06 and TI14 combat system upgrades and beyond is the responsibility of Sustainment. SEA 1439 Phase 4A performed the installation for CS06 on HMAS <i>Rankin</i> and the installation for TI14 on HMAS <i>Collins</i>.</p>

3.3 Progress Toward Materiel Release and Operational Capability Milestones

Item	Original Planned	Achieved /Forecast	Variance (Months)	Notes
Initial Materiel Release (IMR)	N/A	Dec 09	N/A	1
Initial Operational Capability (IOC)	Mar 08	May 08	2	1
Final Materiel Release (FMR)	Jan 16	Oct 18	33	2
Final Operational Capability (FOC)	2010	Dec 18	96	3

Notes	
1	The RCS baseline (CS04) installed in HMA Ships <i>Waller</i> and <i>Farncomb</i> was approved for IOR by CN in May 2008 and September 2009 respectively. CN subsequently approved OR of that baseline on 9 December 2009.
2	FMR date was set at project approval before the submarine FCD program had reached maturity in terms of the length of dockings and impact of emergent work and other capability upgrades. As a result, the RCS installation schedule has been delayed, with final installation to be completed in HMAS <i>Collins</i> in 2018.
3	FOC date was set at project approval before the submarine FCD program had reached maturity in terms of the length of dockings and impact of emergent work and other capability upgrades. As a result, the RCS installation schedule has been delayed.



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

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Section 4 – Materiel Capability Delivery Performance

4.1 Measures of Materiel Capability Delivery Performance

Pie Chart: Percentage Breakdown of Materiel Capability Delivery Performance	
	<p>Green: Replacement combat systems are being delivered in accordance with the project's approved scope. CN has approved OR for the CS04 baseline installed in HMA Ships <i>Waller</i> and <i>Farncomb</i> and OR for the CS05 baseline installed in HMA Ships <i>Dechaineux</i>, <i>Waller</i> (installed by sustainment) and <i>Sheean</i>. The CS06 baseline installed in HMAS <i>Rankin</i> and the T14 baseline in HMAS <i>Collins</i> is to be certified by Sustainment (i.e not subjected to IOR or OR).</p> <p>Amber: N/A</p> <p>Red: N/A</p>
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 RCS on HMAS <i>Waller</i> achieved December 2009, incorporating completion of CS04 sea trials and CS04 OR.	Achieved
Final Materiel Release (FMR)	Completion of CS04 and CS05 OR and installation of a RCS on each of the six submarines. FMR is planned for October 2018.	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
N/A	N/A
Emergent Risks (risk not previously identified but has emerged during 2017–18)	
Description	Remedial Action
N/A	N/A

5.2 Major Project Issues

Description	Remedial Action
N/A	N/A

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							Total
		Schedule	Cost	Requirement	Technical Understanding	Technical Difficulty	Commercial	Operations and Support	
Project Stage	Benchmark	10	8	8	8	9	8	9	60
Initial Materiel Release	Project Status	9	9	10	9	9	8	10	64
	Explanation	<ul style="list-style-type: none"> Schedule: The last boat installation for the project to achieve FMR is HMAS <i>Collins</i>. FCD timings have changed substantially in the past. However, with the introduction of a configuration controlled Collins IMS, the project is now confident that schedule will be met. Cost: The costs for the remaining project work on HMAS <i>Collins</i> are known, and the remaining Project budget and contingency is considered adequate to cover reasonable remaining project cost risk. Requirement and Technical Understanding: The CS05 baseline has been at sea on operational submarines since 2010. Transitioning of the final baseline on HMAS <i>Collins</i> was achieved in June 2018. Operations and Support: The performance of the Combat System has been proven in other submarines. Installations, including logistic support, is at a mature state. 							

Project Stage	Maturity Score
Enter DCP	13
Decide Viable Capability Options	16
1st Pass Approval	21
Industry Proposals / Offers	30
2nd Pass Approval	35
Contract Signature	42
Preliminary Design Review(s)	45
Detailed Design Review(s)	50
Complete Sys. Integ. & Test	55
Complete Acceptance Testing	57
Initial Materiel Release (IMR)	60
Final Materiel Release (FMR)	63
Final Contract Acceptance	65
MAA Closure	66
Acceptance Into Service	67
Project Completion	70

2016-17 MPR Status - - - - - 2017-18 MPR Status - - - - -

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Section 7 – Lessons Learned

7.1 Key Lessons Learned

Project Lesson	Categories of Systemic Lessons
Ensure that adequate staffing and resources are available, in particular if Defence is to be both the prime systems integrator and Project Authority.	Resourcing
Ensure that all project dependencies are established before schedule is established.	Schedule Management
Identify all requirements for technical data and technology as early as possible in the project to allow the transfer requests to be administered. US Government International Traffic in Arms Regulation can require up to a year to progress.	Requirements Management
Engaging in a joint development project where Australia is the junior partner and largely dependent on the US Government program can introduce project management, cost, technology, gaps in OQE and schedule risk that needs to be addressed.	First of Type Equipment
Robust procedures, processes and discipline must be implemented when managing requirements for multiple baseline combat systems. Maintaining expertise with a Requirements Management tool is essential to ensure reliable outputs and reduced re-work.	Requirements Management
Discipline in writing robust and understandable descriptions for failed requirements, deficiencies and non-compliances is essential. The deficiencies should be written to inform both technical and operational personnel. The benefit is better quality documentation and less re-work by other staff in the future.	First of Type Equipment

Section 8 – Project Line Management

8.1 Project Line Management in 2017–18

Position	Name
Division Head	Mr Stephen Johnson
Branch Head	Mr. David Cochrane (to Aug 17) CAPT Adam Lindsay (Aug 17–current)
Project Director	Mr Tony Hodson (to Aug 17) Mr. Damien McGinnes (Aug 17–current)
Project Manager	CMDR Ian Jimmieson (to Jan 18) CMDR Rod Horsburgh (Jan 18–current)

