MAJOR PROJECTS REPORT 2018

1 July 2017 – 30 June 2018

New Zealand DEFENCE FORCE
Te Ope Kātua O Aotearoa
NAVY NZ ARMY AIR FORCE

New Zealand MINISTRY OF DEFENCE
Manatū Kaupapa Waonga

ISBN:978-1-98-851508-3 (Print)
ISBN: 978-1-98-851509-0 (Online)

Published in August 2019

www.defence.govt.nz

CONTENTS

FOREWORD

Foreword from the Secretary of Defence and the Chief of Defence Force

For nearly a decade the *Major Projects Report* has provided an overview of major defence projects that are being delivered as part of an ongoing programme of investment. This investment is to replace, upgrade and refurbish the capability that is used by the New Zealand Defence Force, ensuring it can continue to operate at the high level that is expected of it every day.

The Office of the Auditor-General has provided external assurance that Defence's assessment of its performance in relation to these projects can be read with confidence as a reliable source of information. This year we have tried to increase the value the report has to its readers by consolidating what has been a multi-volume annual publication into one volume, making it a seamless process for readers to explore the purpose, approach and progress of each of the seven projects included in this edition.

Project information is provided within the context of the broader change process Defence has undergone to ensure it has the capacity and capability to deliver. During the life of this report series, Defence has undergone a significant programme of development, improving project management processes and seeking to enhance the outcomes and benefits that are delivered.

This has been aided by the significant increase in investment in Defence's operational funding that led to the development and implementation of our capability management system. The purpose of this system is to enable the Government's Defence policy through the cost-effective design, delivery and maintenance of military capability, along with its eventual disposal.

The Defence Capability Change Action Programme has been key to delivering this, and the success to date has seen attention move to embedding the new system in Defence's culture.

The value of the capability management system is being recognised across the Ministry of Defence and the New Zealand Defence Force for the standardisation, accessibility and overall improved delivery practices that it brings. On top of the investment benefits of the programme, our goal within this area of our work is to be recognised as an exemplar across both the public sector and globally.

Independent reviews of the procurement process reinforce confidence in the improved results seen over the years. The Review of Defence Procurement Policies and Practices for Major Capability Projects, led by Sir Brian Roche KNZM, concluded that decision makers can have a strong level of confidence and assurance in the system. Alongside this, The Treasury's 2018 Investor Confidence Rating process provided an updated and expanded assessment of Defence. In 2015 a B rating was based on an assessment of the Major Capability portfolio. The latest B rating assessed a wider scope that included Capability minor projects, estate and some information and communication technology, along with organisational components.

However Treasury's assessment was that, in the three years since its first assessment of the Major Capability portfolio, Defence has continued to perform strongly, with changes taking place that have led to improved results in benefits management, as well as management in portfolio, programme and project management, and organisational change. This portfolio's results have been raised to an A rating.

We are proud as well of the findings of Ernst and Young that Defence's Whole of Life Costing Framework is leading edge within the Public Sector. This is not, however, an opportunity to sit back. Our projects are complex and inter-connected. It is appropriate that we continue to seek independent review of our progress as we seek further improvements, along with assurances that we are maintaining the gains already made. We look forward to welcoming Sir Brian back during

2019 and 2020 to conduct follow up assessments to the external procurement review delivered last year. Together these assessments will provide a three year baseline and growth chart for the future acquisition programme. This will be in addition to The Treasury's biannual investor confidence review process.

Significant progress has been achieved across the portfolio of projects. This edition of the report focuses on seven projects that have been in acquisition, including the Frigate Systems Upgrade (FSU), Maritime Sustainment Capability (MSC) and Network Enabled Army (NEA) projects, which we will continue to report on in future editions in this series.

In December 2017, Cabinet approved an increase in the Frigate Systems Upgrade budget appropriation to address a shortfall for the installation of the new equipment. A re-baselined project schedule was agreed for project delivery and, as a result, HMNZS *Te Kaha* arrived in Canada in March 2018 to be prepared for the upgrade. Equipment and systems were removed in time for the installation phase to start, on schedule, on 1 May. Both costs and schedule remained on track during the review period.

The Maritime Sustainment Capability project will deliver the new vessel, *Aotearoa*, which will be the NZDF's largest ship. As a new build, this has been a fascinating and complex project. The end of January 2018 saw a key milestone reached when steel cutting commenced. By the end of this report's review period, 54 percent of the steel had been cut, 31 percent of the initial block fabrication had been completed with 23 blocks having progressed through the production workshops into pre-outfitting. Completion of the detailed design enabled the project's focus to move to integrated logistics elements, acceptance activities, customisation and operational testing and evaluation, and the project was on budget and on schedule for operational release in 2021.

The project that is delivering the first tranche of the Network Enabled Army programme focuses on current limitations in the Army and Special Forces' Command, Control, Communications and Computers capabilities. This involves upgrading information technology systems and software, delivering communications access nodes, network-capable combat radios, and a battle management system.

Along with these three ongoing projects, another four will feature for the last time in this edition as they had significantly completed the acquisition phase, or had commenced their closing stages during or just after the period in review:

- The Individual Weapons Replacement project has introduced a new weapon into service, resulting in increased capability, and improved marksmanship and operator confidence.
- New fleets of Special Operations Vehicles have been delivered, ensuring the New Zealand Special Operations Forces have options of vehicles that are better suited and more fit-for-purpose for the range of tasks they are required to undertake.
- Through the Strategic Bearer Network project we have sought to deliver a high capacity network infrastructure with global reach that enables the increasing demand for information to be delivered to and received from our deployed forces.
- The Underwater Intelligence, Surveillance and Reconnaissance project has been restoring the underwater surveillance capabilities of the P-3K2 Orion fleet, progressively fitting anti-submarine sensors to address issues of equipment obsolescence. This is enhancing the New Zealand Defence Force's combat capability, and enhancing New Zealand's ability to contribute at a contemporary level to global efforts to address security risks posed by submarine activities.

These four projects, representing a combined investment of $225 million represent a significant upgrade in capability, and New Zealand's ability to operate internationally as a credible global partner.

The introduction of integrated project teams (IPTs) has made a positive difference to Defence's ability to deliver projects. Their introduction in February 2017 saw IPTs established for FSU, MSC

and NEA. There are now 13 IPT projects across the major projects portfolio. The IPT model is ensuring that Ministry of Defence staff and Defence Force personnel operate in single teams that span the life of each project; from defining the capability requirements, through the recommendations and selection process, and through to delivery and introduction into service phases.

Looking forward to future editions of the Major Projects Report, readers will see a change in language over time. In previous years we have used the term “Major Projects” to refer to those projects with a whole of life cost in excess of $15 million, with “Minor Projects” referring to projects that do not meet that threshold.

In 2018 we agreed to a change to Defence-led and New Zealand Defence Force-led in recognition that cost is just one indicator of potential risk, not the primary indicator. This reflects the continuing growth and maturity of project management across Defence.

The confidence placed in us by the Government and the people of New Zealand is something we do not take lightly and our goal is to ensure that our military personnel have the resources, equipment and wider capability to ensure they can continue to live up to the high standards they have set for themselves, and to live up to the public expectations.

This report is one way in which Defence enables the public to learn more about the work we are doing. Further information is available on both the Ministry’s and the NZDF websites, including proactive releases of information, including Cabinet papers about our capability delivery work, now available.

TONY LYNCH

Acting Secretary of Defence

24 June 2019

KEVIN SHORT

Air Marshal
Chief of Defence Force

28 June 2019

BACKGROUND TO THE MAJOR PROJECTS REPORT: 2018

Background

This is the ninth edition of the Major Projects Report – a series of reports that seek to improve the quality, transparency, and usefulness of reporting on defence capability projects. The result of these publications is a longitudinal overview of performance in the management and delivery of Defence capability projects, and the outcomes achieved. Several projects have featured in multiple editions, reflecting the long-term lifecycle of major Defence projects.

The *Major Projects Report 2018* focuses on seven projects, providing history and definition information. It includes a qualitative and quantitative assessment of Defence's management of those projects, and performance with respect to projects' schedule, cost, and capability in the year 1 July 2017 to 30 June 2018. Financial forecasts for project costs are provided as well.

This information is provided with the context of each project's history and purpose – what it has been expected to achieve, including its policy objectives and capability requirements. Alongside this is information that outlines the acquisition phase and how the capability is being or will be introduced into service.

Changes to this edition

The Major Projects Report has been published since 2010 and has appeared in several years in multiple volumes. This edition marks a move towards consolidating the Major Projects Report in one volume to increase its readability and therefore readers' comprehension of the complex projects.

This edition

In the edition for the year to 30 June 2018, seven projects that featured in the previous year's report are included in this edition with updates on their status, contract payments, risks, and schedule information:

- Anzac Frigate Systems Upgrade
- Individual Weapons Replacement
- Strategic Bearer Network
- Maritime Sustainment Capability
- Special Operations Vehicles
- Underwater Intelligence, Surveillance and Reconnaissance
- Network Enabled Army Tranche One.

Projects not included

The criteria for removing projects from the Major Project Report is when the project finishes its acquisition phase.

On that basis two projects that featured in the 2017 Major Projects Report have been removed from the 2018 edition:

- Anzac Platform Systems Upgrade
- Defence Command and Control Systems.

New projects

Projects are included in the report once the Government has authorised Defence to acquire the capability, and where a project is being managed by the Ministry of Defence as a “Major” project – those with a whole of life cost in excess of $15 million.

No projects fitting this criteria have commenced during the review period.

Defence-led projects

In August 2018 a change in terminology was approved for use in relation to Defence projects.

It was agreed that Defence has one single Capability Portfolio, called the Defence Capability Portfolio. This includes all capability projects, regardless of their scale and risk or the specific approvals and delegations within which they operate.

Two main categories will be within this system; Defence-led and New Zealand Defence Force-led. Future editions of the Major Projects Report will reflect this change.

ASSESSMENT OF PERFORMANCE

This section provides an overview assessment of the seven projects included in this edition of the Major Projects Report. Performance has been considered across three metrics: schedule, budget, and capability.

ASSESSMENT OF PERFORMANCE

Defence's approach, throughout all phases of a project, is to ensure that the capability and benefits sought can be realised within the approved budget, delivered within a reasonable timeframe, and in compliance with the contractual requirements that align with government policy.

The first Major Projects Report, published in 2010, discussed the difficulty experienced in meeting targets across all three of these performance metrics for the projects in that Report. If two of these are held steady, pressures may often be felt on the third. Where possible, Defence's preference is to hold steady on cost (through fixed price contracts) and performance. This means for legacy projects, often schedule has taken the pressure if contractors fail to meet contractual timeframes.

However, operational consequences may result from this approach, impacting on platform availability, scheduled maintenance, and training which require careful management and an integrated approach between the Ministry of Defence and the New Zealand Defence Force.

To mitigate this, Defence's objective has been to ensure no schedule slippage through options such as buying capability "off the shelf", while minimising where possible the need to undertake configuration changes. This approach reflects and is consistent with comments made in 2010 by the Controller and Auditor-General for improving project management.

Where a project is complex in nature, "off the shelf" solutions may not be possible, but where a supplier has proven experience in delivering a solution, their existing approach or methodology may help in planning and delivering to the standard sought across all three metrics.

PERFORMANCE IN THE 2017/18 YEAR

The year commenced with the Anzac Frigate Systems Upgrade project facing significant pressure in relation to both its costs associated with installation and the project schedule, which was reporting a 21 month cumulative delay. In December 2017 Cabinet approved increased project funding and a revised schedule enabling the project to re-baseline. The FSU project ended the 2017/18 review period on track across the three metrics of schedule, cost and capability.

Apart from this project, performance across other projects has resulted in a self-assessment by Defence for the 2017/18 year determining overall standard of Very Good. This framework considers performance across cost, project schedule, whether the capability and benefits are still expected to be achieved. Although schedule variances have been taken into account in this year's assessment, the improvement on the previous report's Good self-assessment (the year to 30 June 2017) reflects the re-baseline of the Frigate Systems Upgrade project.

SCHEDULE

Variations were reported in the Individual Weapons Replacement, Special Operations Vehicles, and the Underwater Intelligence, Surveillance and Reconnaissance projects, however none reported anticipated operational impacts.

Delays are noted in the Strategic Bearer Network and Network Enabled Army Tranche One projects. These delays are over those reported in the 2017 edition of the *Major Projects Report*. In particular, Strategic Bearer Network's schedule includes a dependency with the Frigate Systems Upgrade project, and final installation of maritime equipment in the Anzac frigates is not expected to be completed until February 2021.

As outlined on the previous page, significant slippage was reported in relation to the Anzac Frigate Systems Upgrade project, however in spite of the risk of further schedule variation the project remained on schedule throughout the rest of the year in review.

COST

Cost pressures reported in the 2017 edition of the Major Projects Report for the Anzac Frigate Systems Upgrade project were addressed at the end of December 2017 when Cabinet approved an increase in appropriation of $148 million. This ensures that the project's installation phase could proceed along with re-baselining of the project's schedule. The project has remained within its appropriation.

As flagged in the 2017 edition, the Strategic Bearer Network project accessed the $5.6 million in contingency, approved in July 2016, to engage the main contractor for the Anchor Station Infrastructure, and to cover additional installation costs for the Offshore Patrol Vessel maritime terminals. The project remained within its approved budget.

CAPABILITY

Overall, there has been no change in capability requirements for the seven projects carried over from the 2017 Major Projects Report and no capability changes. While projects can be affected by the lack of appropriately skilled personnel to undertake both the acquisition and introduction into service phases, as in previous years, this risk is managed actively.

The following information summarises the projects across the three metrics and operational impact as well as listing cumulative schedule variations since the beginning of each project.

Summary of Three Metrics and Operational Impact for the year to 30 June 2018

Anzac Frigate Systems Upgrade

Cost pressures	In December 2017 Cabinet approved an increase in appropriation of $148 million for installation costs, which were forecast to exceed the earlier approved appropriation of $491 million.
Schedule variation or update	The schedule was re-baselined in December 2017.
Cumulative schedule variations	Cumulative 39 month delay from the project implementation

since original contract forecast	business case baseline.
Capability changes	None.
Operational impact of delay	There is an overlap of the two ships' upgrades.

Individual Weapons Replacement

Cost pressures	None
Schedule variation or update	At 30 June 2018 a delay in export approvals from the US Government and a re-calculation of production/delivery dates from Lewis Machine & Tools to cover off manufacturing processes resulted in a 3 month delay.
Cumulative schedule variations since original contract forecast	3 months for acceptance of Individual Weapon
Capability changes	None
Operational impact of delay	No impact. Following early identification of the delay the project determined in June 2016 that the delivery schedule had time to absorb any potential delays.

Strategic Bearer Network

Cost pressures	None. Available contingency was accessed, but the project is not forecasting to exceed the approved allocation.
Schedule variation or update	Installation of maritime terminals takes place as planned maintenance programmes are undertaken on each vessel, however the installation process is noted as behind baseline schedule. The dates for Full Operational Capability Introduction into Service by the NZDF required the full capabilities of the WGS constellation, which were not available until all nine satellites had been launched. The schedule was delayed further this year, reflecting the availability of the Anzac Frigates for terminal installation within the upgrade plan managed by the Frigate Systems Upgrade project
Cumulative schedule variations since original contract forecast	68 months
Capability changes	None
Operational impact of delay	No impact.

Maritime Sustainment Capability

Cost pressures	None
Schedule variation or update	Neither Preliminary nor Detailed Design milestones were completed on schedule. Production work commenced 29 January 2018, however this is not expected to impact on the forecast acceptance date.
Cumulative schedule variations since original contract forecast	None
Capability changes	None

Operational impact of delay	No impact.

Special Operations Vehicles

Cost pressures	An additional $1.3 million was approved as a technical adjustment for foreign exchange.
Schedule variation or update	As reported in the 2017 edition, delays in shipping and the relocation of the Jankel factory led to a minor delay in delivery of the Low Profile/Utility and the schedule variation
Cumulative schedule variations since original contract forecast	7 months
Capability changes	None
Operational impact of delay	No impact.

Underwater Intelligence, Surveillance and Reconnaissance

Cost pressures	An additional $0.7 million approved as a technical adjustment for foreign exchange.
Schedule variation or update	A delay in delivery of the prototype (until June 2018) was the result of Sonobuoy Positioning System software issues identified during the design, which were resolved in March 2018. A separate software testing activity was held once the problem was resolved and design acceptance finally occurred in June 2018.
Cumulative schedule variations since original contract forecast	5 months
Capability changes	None
Operational impact of delay	No impact

Network Enabled Army Tranche One

Cost pressures	None
Schedule variation or update	A re-baseline of the NEA Programme Business Case was approved in September 2017. Tranche One is scheduled to complete by June 2020, instead of July 2018.
Cumulative schedule variations since original contract forecast	24 months
Capability changes	None
Operational impact of delay	None

CONTINUOUS IMPROVEMENT IN PERFORMANCE

The first Major Projects Report was published in 2010 and outlined 13 “lessons learned” that had been identified from information contained in project data sheets, observations of project staff, and independent reviews of acquisition projects. These covered improvements, enhancements or scrutiny in or to:

Governance and Leadership:

- governance structures and strategic-level decision points
- accountability and the need for a senior responsible owner to be allocated to projects
- planning and prioritisation across the portfolio of capability projects
- the making of decisions based on reducing costs in the short-term

Project Management

- the criticality of resourcing projects with the right people
- project management planning and having one single plan to improve coordination
- the shortage of staff with the knowledge, expertise and understanding of project procedures

Process and Execution

- enhanced integration and continuity phases of projects
- greater scrutiny of contractor/sub-contractor competence
- the speed of the definition and acquisition phases of projects
- awareness of industry’s ambitious and optimistic project planning
- the technical risks around projects and the need to reduce these prior to contract signing
- incremental acquisition strategies where complex and high risk projects are better suited to this approach.

Additional investment in Budget 2015 increased the Ministry of Defence’s operating funding by $27.1 million over four years. This recognised the demands of the proposed large acquisition programme that, if implemented fully, would see replacement of most of Defence’s major military platforms.

The additional operational funding enabled a significant change programme to be implemented, which would deliver improvements across the joint Capability Management System of the Ministry and the New Zealand Defence Force.

The Defence Capability Change Action Programme (DCCAP) is the means through which these changes are being delivered, and at the end of the 2017/18 financial year DCCAP had been in place for three years.

A number of reviews of the capability management system identified risks in the system and DCCAP was established to systematically address 87 recommendations resulting from these reviews. By the end of the reporting period, 84 recommendations had been closed. Although slightly behind the original forecast of 100% closure by June 2018, this was up from 33 recommendations closed by June 2017.

The resulting lessons learned have influenced the way Defence approaches procurement. Cost reduction is important when investing in large-scale capability projects. This has seen a commitment to:

- exploring the purchase of off-the-shelf capabilities where possible
- ensuring capabilities that are acquired are interoperable with our Defence partners
- implementing effective project practices to ensure each project’s governance and risk and project management approaches align with the investment scale and the assessed level of risk

- a preferred approach of finalising through-life support arrangements at the time of contract signature, as demonstrated in the Underwater Intelligence, Surveillance and Reconnaissance project.

In April 2018 the *Review of Defence Procurement Policies and Practices for Major Capability Projects*, which had been led by Sir Brian Roche KNZM, concluded that the DCCAP process had *"addressed the structural, operations and information deficiencies of the previous system"* and *"provides decision makers with a strong level of confidence and assurance to support informed decision making"*.

Progress made over recent years has been reflected as well in outcomes of other independent assessments and reviews that took place during the year including:

- Defence's improved Treasury Investor Confidence Rating, which saw the Capability portfolio assessed at an A rating, an improvement from the B rating achieved when it was first assessed in 2015.
- The finding of an assessment by Ernst and Young that Defence's Whole of Life Costing Framework is leading edge across the Public Service.

To ensure ongoing development and consolidation of the work done to date, the external procurement review will be repeated as an annual exercise for the next two years (2019/2020), creating a baseline for future measurement. This will be done in addition to The Treasury's bi-annual Investor Confidence Rating review.

INTRODUCTION INTO SERVICE

Points to note for the 2017/18 year in relation to Introduction into Service plans for the platforms or systems are:

- Anzac Frigate Systems Upgrade: the re-baseline of the project established a new schedule for delivery of the vessels and the introduction into service plans are in development.
- Individual Weapon Replacement Project: The Introduction into Service plan was implemented during 2016 and 2017, with completion of maintainer training and the introduction of operator training in October 2016. The weapon instructors, drawn from all services, have been conducting cascade training throughout camps and bases in New Zealand. Training has continued during the 2017/18 year, with top marksmanship rates using the new MARS-L doubling in comparison with the rates achieved using the replaced Steyrs.
- Maritime Sustainment Capability: The Introduction into Service Plan has been superseded by a Capability Integration Plan. A draft plan has been developed and circulated for stakeholder review.
- Strategic Bearer Network: the two terminals for the offshore patrol vessel terminals and a third for HMNZS *Canterbury* being delivered under this project were installed and tested. Anzac Frigate terminals will be installed subject to their availability and existing upgrade plan, which is managed under the Frigate Systems Upgrade project.
- Special Operations Vehicles: the Introduction into Service plan was signed in April 2017. The Low Profile/Utility vehicle fleets were released for use in July 2018 as forecast. The Heavy Mobility (Supacat) and Protected Mobility (Bushmaster) fleets achieved interim operational release in August 2018. Full operational release will be granted once the NZDF Landworthiness Authority have closed off all requirements in relation to these fleets.
- Underwater Intelligence, Surveillance and Reconnaissance: Initial Operating Capability and Introduction into Service was achieved in June 2018.

DEPUTY AUDITOR-GENERAL'S COMMENTARY

Background

In 2008, our Office identified a need for the Ministry of Defence and the New Zealand Defence Force (together referred to as "Defence") to report better and more complete information to show how well they manage projects to acquire new defence capability (capability projects).

Since 2010, the Ministry of Defence has produced annual Major Projects Reports that report on the status of capability projects that had been approved by Cabinet and are being managed by the Ministry. My staff have reviewed these reports in order to provide assurance about the reliability of the information.

Review of the *Major Projects Report 2018*

My commentary covers the *Major Projects Report 2018*, which is now presented in one volume.

My staff reviewed the changes to the project status reports in the *Major Projects Report 2018*. The project status reports present detailed information about how each of the seven projects is meeting capability needs, cost, and schedule (timeline). The results of this review are reported on pages 17 to 19.

My staff also reviewed the Assessment of Performance section of the *Major Projects Report 2018*, which provides Defence's summary assessment of its performance in managing and delivering the seven projects.

Overall view of the *Major Projects Report 2018* and reported performance

Overall, I consider that Defence has assessed its performance in managing the seven projects during the 2017/18 year in line with its assessment framework. This framework considers the proportion of projects performing within expectations for capability needs, cost, schedule and benefits at 30 June 2018.The work performed by my staff does not consider the adequacy of the framework, however, we have reviewed Defence's application of the framework. In line with the framework, Defence has self-assessed their performance as *Very Good*.

While I note that the year-end performance of the projects is in line with the assessment framework, there are two projects where additional funding and/or a new schedule have been approved during the year to address previous performance issues:

- Of particular note is ANZAC Frigate Systems Upgrade, which received additional funding and schedule changes through the 2018 Supplementary Estimates. This has meant that this project was performing at 30 June 2018 within the revised cost and schedule expectations.
- The Network Enabled Army, Tranche One project schedule was re-baselined during the year. This meant that, as at 30 June 2018, the governance milestones were reported as within expectations. I note that challenges subsequent to 30 June 2018 have meant that the project's schedule is again under pressure. Details of the post June 2018 impact are reported on page 117.

The Strategic Bearer Network project is also tracking behind the Cabinet-approved schedule. No amendments to the schedule were sought for this project and, as a result, performance issues for this project are noted in the Strategic Bearer Network Project Status Report.

Some delays have been noted in achieving governance milestones for the Special Operations Vehicles and Individual Weapons Replacement and Underwater Intelligence, Surveillance and Reconnaissance projects. These were transitioned to in-service late 2018 and are now proceeding through formal closure procedures.

The review has also enabled some observations of the completeness of the information contained in the report. These are detailed below.

General commentary on the *Major Projects Report 2018*

One of the major changes in the report this year is the move from three volumes to one. I commend Defence for having made this move, and believe that this will assist in making information on major projects more accessible for users of the report by providing all information relevant to a project in the one place. It enables the reader to follow each project from inception through to the current position.

It is rare, however, for such a change to lead to a perfect document the first time. Following this step, I believe that there are ongoing opportunities for Defence to continue further improvements to the report. This could include the consistency of information reported by projects, consistency of terms, and developing some of the current performance story by providing more of an explanation for current performance. For example, this could include tracking performance against re-baselined milestones.

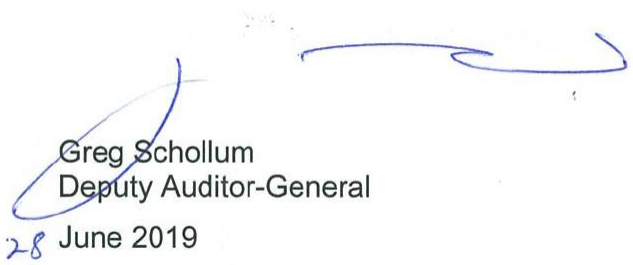
In combining the previous three volumes, some information, mainly relating to project risk, has not been carried through. The level of detail included previously did not align with the more concise approach and was not as useful for the assessment of projects' risk management performance. However, the report would benefit from the inclusion of projects' risk information, particularly on significant risks to capability for being able to be brought into service as planned. Defence should consider what risk information could be added in future.

Previous Major Projects Report editions presented individual projects slightly differently from broader programmes of work. Combining the three volumes has highlighted that there will be value now in increasing the depth of information available in relation to the Network Enabled Army programme and specifically Tranche One. While I acknowledge that the complexity of this programme is more significant, it is nevertheless important to ensure that the decision-making processes applied and how the programme is being delivered as a whole are communicated through these reports. At present, the performance of the programme is not addressed in the *Major Projects Report 2018*, and details of the capability definition and acquisition stages are not detailed compared with the other projects. I encourage Defence to consider how this can be improved.

The improvements have also revealed other questions that were less apparent in the past. Our review noted that, when a project reaches completion, it is no longer included in the report. The out-turn of a project is therefore not made publicly available. I believe that including some information on projects' final performance would be beneficial.

My staff observed a much improved approach to the level of documentation provided to support the changes in the report. While the timeliness of the report preparations has improved, there remains a time lag in producing the report. In my view, the value of this report is reduced when it is not prepared in a timely manner. However, I acknowledge the efforts being made by Defence to move back to a more timely production of the report, and I encourage this.

I would like to thank the Ministry of Defence and the New Zealand Defence Force for their assistance and co-operation during our review.



Greg Schollum
Deputy Auditor-General
28 June 2019

INDEPENDENT REVIEW REPORT TO THE READERS OF THE MINISTRY OF DEFENCE AND NEW ZEALAND DEFENCE FORCE'S MAJOR PROJECTS REPORT FOR THE YEAR ENDED 30 JUNE 2018

I have carried out a review of the project status reports included in the *Major Projects Report 2018* prepared by the Ministry of Defence and the New Zealand Defence Force (together referred to as "Defence"). The purpose of this report is to express a conclusion on whether any matters have come to my attention to indicate that the project status reports provided by Defence are not fairly disclosed.

I have used my staff and resources to carry out the review.

The project status reports on pages 22 to 122 cover the following acquisition projects:

- ANZAC Frigate Systems Upgrade;
- Individual Weapons Replacement;
- Strategic Bearer Network;
- Maritime Sustainment Capability;
- Special Operations Vehicles;
- Underwater Intelligence, Surveillance and Reconnaissance; and
- Network Enabled Army Tranche One.

These projects are collectively referred to as "the specified acquisition projects".

Review work carried out

The review was carried out in keeping with the Auditor-General's Auditing Standard 5: *Performance audits, other auditing services, and other work carried out by or on behalf of the Auditor-General* and the External Reporting Board's International Standard on Assurance Engagements (New Zealand) 3000 (Revised): *Assurance Engagements Other than Audits or Reviews of Historical Financial Information*. The review was also carried out in keeping with the Auditor-General's Statement on Quality Control, which requires compliance with the External Reporting Board's Professional and Ethical Standard 3 (Amended): *Quality Control*.

A review provides limited assurance, which is substantially lower than the assurance that would have been provided had an audit been performed. The procedures performed in a review vary in nature and timing from, and are less in extent than for, an audit.

The review involved carrying out procedures and making enquiries in order to reach my conclusion. These procedures and enquiries included:

- reconciling the non-financial information in the project status reports to supporting documentation provided by Defence;
- reconciling financial information in the project status reports to the supporting Capability Management Group financial reporting provided by Defence;
- reconciling selected financial information in the project status reports to the Ministry of Defence's audited financial statements for the year ended 30 June 2018;
- seeking explanations from Defence staff for any questions arising from the reconciliations; and
- considering the effect of events subsequent to 30 June 2018 on the fair disclosure of the project status reports up to the date of this independent review report.

Inherent uncertainty in the project status reports

The project status reports contain certain future-focused disclosures about expected achievements, planned time frames, forecast expenditure, and intended capability requirements. There are also disclosures about project risks. This information is, by its nature, inherently uncertain.

The review was limited to reconciling such disclosures to reliable supporting documentation and, where necessary, obtaining satisfactory explanations from Defence staff. Some forecast information relies on the expert judgement of the Defence staff involved in each project and assumptions about future events and management's actions. Whether those forecasts will prove accurate depends on future events or circumstances. Because of that uncertainty, what takes place might be materially different from what is forecast in the project status reports.

Responsibilities of Defence

The Secretary of Defence and the Chief of Defence Force are responsible for preparing the *Major Projects Report 2018* to fairly disclose information about the specified acquisition projects. It is therefore their responsibility to decide what information is included in the report and what is not. The project status reports are expected to include:

- a description of the project;
- the status of the project as at 30 June 2018;
- financial performance against the budgets approved by Cabinet;
- expected achievements;
- planned time frames;
- forecast expenditure; and
- intended capability requirements.

Fair disclosure of the project status reports requires that the information, where applicable, is:

- relevant;
- faithfully represented;
- understandable;
- timely;
- comparable; and
- verifiable.

My responsibility

My responsibility is to review the project status reports and to reach an independent conclusion about whether the project status reports are fairly disclosed based on the review procedures and enquiries that have been carried out.

Independence

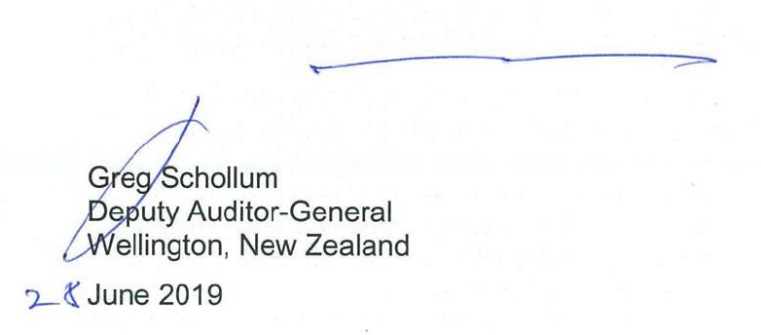
The review was carried out in keeping with the Auditor-General's Statement on *Code of Ethics for Assurance Practitioners*, which requires compliance with the External Reporting Board's Professional and Ethical Standard 1 (Revised): *Code of Ethics for Assurance Practitioners*.

As the Deputy Auditor-General, I am constitutionally and operationally independent of the Ministry of Defence and the New Zealand Defence Force. In addition to performing functions

and exercising powers under the Public Audit Act 2001 as the auditor of the Ministry of Defence and the New Zealand Defence Force on behalf of the Auditor-General, Audit New Zealand has carried out an independent assurance engagement that is compatible with the independence requirements. Other than this independent review, the audits of the Defence entities, and the independent assurance engagement, I have no relationship with, or interests in, the Ministry of Defence or the New Zealand Defence Force.

Conclusion

Based on the review, nothing has come to my attention that causes me to consider that the project status reports included in the *Major Projects Report 2018* have not been fairly disclosed.



Greg Schollum
Deputy Auditor-General
Wellington, New Zealand
26 June 2019

PROJECT STATUS REPORTS

The project summaries contained in this part of the Major Projects Report provide a concise, simple and high level overview of each major project. The summaries include a description of each project's policy objectives and capability requirements; the current status with respect to capability, schedule and cost; active high level risks and issues; recent developments; and financial performance.

READERS' GUIDE

The following keys should be used when reading the current project status and active risks tables contained within each summary.

Key for Risk and Current Status	
	On track. The risks or issues that exist will have little or no impact on the ability to deliver project outputs, objectives or goals. Little or no resource allocation or management effort is required.
	Medium. The risks or issues that exist may temporarily degrade the ability to deliver project outputs, objectives and goals. A moderate level of resource allocation or management effort is required.
	High. The risks or issues that exist could degrade the ability to deliver project outputs, objectives and goals. A high level of resource allocation or management effort is required.
	Critical. The risks or issues that exist could significantly degrade or prevent the ability to deliver project outputs, objectives and goals. Significant resource allocation or management effort is required.

EXPLANATION OF TERMS

BETTER BUSINESS CASES:

Project Charter: Defence project initiation is guided by the Defence White Paper 2010 and the 2011 Defence Capability Plan. Projects commence following notification to the Minister of Defence and approval of a project charter by the Capability Management Board.

Approval of Indicative Business Case (IBC): Attained when Cabinet agrees to the strategic context for an investment and agrees to progress a short list of capability options to the Detailed Business Case stage.

Approval of Detailed Business Case (DBC): Attained when Cabinet agrees to a refined capability requirement and authorises Defence to comment formal engagement with industry (through a request for proposal or request for tender) on a preferred capability option.

Approval of Project implementation Business Case (PIBC): Attained when Cabinet agrees that Defence can conclude a contract based on the preferred supplier, the negotiated services, the maximum funding level and the arrangement to manage the project and the ongoing delivery of services.

GOVERNMENT APPROVAL MILESTONES

Project Initiation: Occurs once a capability requirement has been identified by Defence and a broad assessment of the options for meeting the capability requirement has been authorised by the Chief Executives and noted by the Minister of Defence.

Approval to Initiate: Attained when Cabinet agrees to the project's inclusion on the capital acquisition plan and authorise Defence to engage with industry to refine its initial assessment with more accurate information.

Approval to Commence: Attained when Cabinet agrees to the refined capability requirement and authorises the Ministry of Defence to commence a formal tender and tender evaluation process.

Approval to Negotiate: Attained when Cabinet agrees to the selection of a preferred tender, specifies funding limits, and authorises the Ministry of Defence to enter into contract negotiations.

Approval to Commit: Attained when Cabinet agrees to the final contract and authorises the Ministry of Defence to sign the contract and commit funding.

PROJECT PHASES:

The capability definition phase: During the capability definition phase, capability and operational requirements are assessed and refined. Stakeholder needs are considered. Scenarios may be used to identify requirements. Hypothetical options which include a rough order of costs are used to analyse affordability and evaluate requirements. A capability requirement is a description of the ability needed to achieve the policy objective. An operational requirement is a description of a component of what is required to complete a task. Options analysis in the capability definition phase is used as a tool to compare, assess, and evaluate capability and operational requirements. Options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

The acquisition phase: procures the capability solution. Deeper analysis of requirements and options may be required once defence industry is engaged. Included in this stage are processes for tendering, contract negotiation and acceptance of what has been agreed will be delivered.

The introduction into service phase: develops the force elements required to generate NZDF outputs at a specific level of capability. Part of this stage is the operational test and evaluation process, which demonstrates the capability has met specific standards of safety and is operationally effective in accordance with the suite of operational concept documentation.

COMMONLY USED TERMS

- Interim Operational Release/Initial Operational Capability: the point at which the inherent capability is understood so that it can be most effectively employed on operations.
- Full Operational Release/Full Operational Capability: final acceptance from the New Zealand Defence Force for the capability.

ANZAC FRIGATE SYSTEMS UPGRADE

Project Description: The primary objective of the Anzac Frigate Systems Upgrade Project is to restore the frigates' ability to fulfil credible combat roles and provide high quality surveillance products in the contemporary and emerging security environment. This will ensure that the Government retains the ability to deploy the frigates to the Pacific and beyond, enabling them to operate with confidence in low- to medium-threat environments.

THE PURPOSE OF THIS PROJECT

The Frigate Systems Upgrade Project (FSU), originally known as the Self Defence Upgrade, was initiated in 2007. The Royal New Zealand Navy had advised that the Anzac frigates, HMNZS *Te Kaha* and *Te Mana*, were over 10 years old and that many of the surveillance and combat systems were becoming obsolete and in need of replacement. Threats in the maritime environment had also changed, with new technology once only available to larger countries now becoming available to small states and other groups.

This project will ensure that the mission and weapon systems on board the Anzac class frigates continue to contribute towards their combat viability, addressing the erosion of capability that has continued to occur through a combination of system obsolescence and emerging threats.

By maintaining the combat effectiveness and efficiency of the Anzac frigates over their remaining lives this will sustain and enhance the Naval Combat Force's contribution toward government options for:

- defending New Zealand's sovereignty, its Exclusive Economic Zone and territorial waters
- operating with the Australian Defence Force to discharge our obligations as an ally of Australia
- contributing to peace and stability operations in the South Pacific
- contributing to whole-of-government efforts at home in resource protection
- participating in Five Power Defence Arrangements and other multilateral exercises or operations
- protecting New Zealand's interests in the Southern Ocean and Ross Dependency
- providing a physical demonstration of New Zealand's commitment to regional and global security, including protecting sea lines of communication.

The *Defence White Paper* published in 2010 had reiterated the requirement of the Government at the time that the frigates will provide effective, credible combat capabilities, and for the frigates to be given a self-defence upgrade by 2017[1] to address obsolescence and to improve their defensive capability against contemporary air and surface threats.

CAPABILITY REQUIREMENTS

The capability requirements necessary to support these policy objectives include:

[1] Since publication of the Defence White Paper 2010, changes to the project's schedule have seen the completion date updated (see page 35, Schedule of Introduction into Service)

- **Participation:** the ability to participate in national, allied and coalition activities to the Combined Force Commander in order to maximise the effective contribution made.
- **Strategic Situational Awareness:** the ability to achieve situation awareness of electromagnetic emissions to the Combined Force Commander and specified agencies in support of tactical and strategic objectives.
- **Air Threat to Others:** an ability for a defended surface unit to operate in an area under an air threat to the Combined Force Commander in order to undertake its designated mission.
- **Surface Threat to Others:** the ability to deliver the neutralisation of a surface delivery platform prior to its weapon launch to the Combined Force Commander in order for a defended unit in close proximity to be able to continue with its mission.
- **Effects Ashore:** the ability to deliver effects ashore from organic weapons to the Combined Force Commander in order to support land operations.
- **Through Life:** the Logistics Commander (Maritime) is able to deliver availability to the Commander Joint Forces New Zealand a platform that can complete a mission throughout its remaining life.

FSU's Better Business Case Milestones

Date	Approved By	Approval
June 2007	Secretary of Defence & Chief of Defence Force	**Original Project Charter.**
29 March 2012	Secretary of Defence & Chief of Defence Force	**Revised Project Charter.**
6 August 2008	Cabinet POL Min (08)14/6	**Approval of Indicative Business Case.** Cabinet agreed that all five options be fully developed for a main gate business case that will be prepared by officials.
12 November 2012	Cabinet CAB Min (12) 40/5A	**Approval of Detailed Business Case.** Cabinet approved Option 4[2] and authorised the Secretary of Defence to issue Requests for Tender.
14 April 2014	Cabinet CAB Min (14) 13/14	**Approval of Project Implementation Business Case.** Cabinet agreed to proceed with the FSU and authorised the Secretary of Defence to conclude contracts.
6 December 2017	Cabinet CBC-17-MIN-0037	**Approval of additional funding.** Cabinet agreed to $148 million additional funding to complete equipment installation.

[2] Option 4 is described below.

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

The project team carried out an analysis to identify the technical requirements for the FSU.

A number of mission systems were identified as facing imminent obsolescence and their support was becoming increasingly difficult and expensive. An Indicative Business Case (IBC) was developed and presented to Cabinet in which a range of options of increasing complexity and cost were identified.

Cabinet agreed in August 2008 that all five options should be developed and costed in the Detailed Business Case (DBC). Shortly after work on the DBC had begun, the Government announced work on a new Defence White Paper. Work on the FSU was paused until the White Paper had been completed in 2010 and the future of the frigates had been confirmed.

The DBC developed four options. The fifth option presented in the IBC, to counter higher levels of threats, was not advanced in the DBC due to its higher cost. An additional option that closely replicated the upgrade being planned for the Royal Australian Navy was included in the options analysis as an upper bound comparator.

The systems considered for upgrade or replacement were:

- Combat Management System
- Tactical Radar Systems
- Defensive Missile Systems
- Infrared Search and Track
- Radar Electronic Support Measures
- Underwater sonar
- Tactical datalinks
- Decoys
- Torpedo Defence System
- Combat System Trainer.

How Defence analysed the requirements options in the Capability Definition phase

The project team developed a cost-benefit model in order to compare various combinations of core combat system components, user requirements and the indicative costs for each system derived from Request for Information data. It assessed the contribution of each component to the benefits and then compared costs. The most cost-effective packages were grouped into four options that presented the greatest benefit for that level of cost.

How Defence considered interoperability

Interoperability was one of the key considerations of the FSU project. The frigates need to remain interoperable with our partners, especially Australia. The Anzac frigates are part of a joint capability programme between New Zealand and Australia. As a result, the frigates comprise New Zealand's main contribution toward naval combat force Anzac operations and exercises.

Under the original Anzac acquisition programme, New Zealand and Australia laid the foundations for joint management and support of the ships throughout their lives. This was formalised through the 1991 signing of an Implementing Arrangement for the Management of Assets and the In Service Support of the Anzac class frigates and shore facilities.

The Royal Australian Navy has an upgrade project for their Anzac class frigates underway, and systems common to both navies were incorporated in the options considered. Each of the options was designed to retain interoperability with Australia and other partners while providing a useful level of complementary capabilities.

How Defence considered through-life costs and issues

In general, the FSU project is replacing existing systems with contemporary versions. In many capability areas, the systems have been simplified in both architecture and quantity while increasing capability. There are, however, also new technologies that will be introduced which are not currently in service.

Changes in through-life costs were estimated from a range of sources, including historic costs and industry information. From this broad base of information a cost model was developed resulting in a discounted net present cost for each option, allowing a financial comparison between options.

Requirements Analysis in the Capability Definition Phase

Options considered	Cost Estimates (NZ$ million)	Advantages	Disadvantages
Option 0: No upgrade	$0	No capital cost.	Does not meet policy expectations.
Option 1: Surveillance Capability This option would allow the ships to conduct surveillance missions but only in a low threat environment in the Southwest Pacific and to a limited extent elsewhere.	$253-271	Meets intelligence, surveillance and reconnaissance (ISR) requirements in low threat environments in the Southwest Pacific.	Does not meet ISR requirements, nor combat and protection roles outside the Pacific.
Option 2: Air Threat Capability This option undertakes most of the upgrades listed in Option 1 plus it provides the minimum requirements to defend the ship against air threats.	$298-318	Meets ISR requirements in all regions plus a minimum air defence capability.	Does not meet combat and protection roles outside the Pacific region.
Option 3: Limited Multi-Threat Capability This option builds on Option 2 by including an obsolescence upgrade to the existing sonar and the missile decoy system.	$313-332	Meets ISR requirements in all regions. Meets underwater surveillance and missile decoy requirements.	Does not meet combat and protection roles outside the Pacific region, including detection and defence against torpedoes.

Options considered	Cost Estimates (NZ$ million)	Advantages	Disadvantages
Option 4: Multi-threat Capability In addition to Option 3, this option provides a practical and sustainable level of defence against torpedo threats and increases the number of missiles in the anti-ship missile system.	$354-374	Meets all policy expectations for ISR, combat and protection.	Higher capital cost than other options.

An additional option was developed to replicate as closely as possible the Australian Anzac frigate upgrade. This comparator was used to compare costs, benefits and risks.

Option 5: Australian Upgrade Comparator This option matches closely the upgrade path being pursued for the Australian Anzac frigates.	$411-431	Meets all policy expectations for ISR, combat and protection. Builds on development work undertaken by Australia.	High capital cost. Likely to incur higher support and maintenance costs. The result is an option of high cost and lower overall benefit compared to Option 4.
ASSESSMENT: Option 4 was assessed to be the best solution. It restores the frigates to their original baseline against contemporary threats and updates all obsolete equipment. It would give the Government the confidence to deploy the frigates either alone or as part of a joint task force to regions where credible threats are likely to be faced. Option 4 achieves significantly increased deployment options for the frigates, via a relatively small marginal increase in cost over Options 1-3. Option 5 would provide an upgrade at higher cost and lower overall benefit.			

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:	**Operational Requirements** necessary to support the capability include:
1. Participation The Command shall be able to deliver the ability to participate in national, allied and coalition activities to the Combined Force Commander in order to maximise the effective contribution made. **2. Strategic Situational Awareness** The Command shall be able to achieve situation awareness of electromagnetic emissions to the Combined Force Commander and specified agencies in support of tactical and strategic objectives. **3. Air Threat to Others** The Command shall be able to deliver an ability for a defended surface unit to operate in an area under an air threat to the Combined Force Commander in order to	Combat Management System (CMS). The CMS is the human-machine interface used to control weapons and sensors in manual, semi-automatic and automatic modes. It provides the display mechanism for all ship sensors allowing disparate information from numerous sources to be fused into a single picture. The ship cannot operate in an ISR, intelligence or combat role without the CMS. Intelligence Systems. These are highly sensitive radio and radar receivers able to direction find and analyse emissions to aid in identification. They contribute to both tactical and strategic outputs. Radar Systems (Surveillance and Reconnaissance). Military radars use

undertake its designated mission. **4. Surface Threat to Others** The Command shall be able to deliver the neutralisation of a surface delivery platform prior to its weapon launch to the Combined Force Commander in order for a defended unit within 4 km to be able to continue with its mission. **5. Effects Ashore** The Command shall be able to deliver effects ashore from organic weapons to the Combined Force Commander in order to support land operations. **6. Through Life** The Logistics Commander (Maritime) shall be able to deliver availability characteristics to the Commander Joint Forces NZ in order to enable completion of a mission throughout the life of the platform.	sophisticated technologies that allow the tracking of small and fast objects against a background of land and in the presence of a cluttered electromagnetic environment. Optronics (Surveillance and Reconnaissance). Use of both the visible and infrared spectra provides a significant passive means of detection, tracking and identification. Infrared Search and Track (IRST) systems provide near continuous 360° observation. The infrared component of these sensors allows a high level of capability to be maintained at night and in poor atmospheric conditions. Air Defence. Air defence against attacking aircraft or missiles is local area and point defence. They span a range from approximately 2km to 30km from the ship and can include the ability to defend protected units (usually other vessels) within a limited range. This defence is considered credible for a general purpose frigate and is achieved using Point Defence Missile Systems. Closer in defence is conducted at ranges less than 2km and uses systems such as the Phalanx Close-in Weapons System (CIWS) and missile decoys such as chaff. Anti-Surface. Existing weapons provide strike capability for anti-surface warfare. The FSU project will need to bridge the capability gap in the sensors necessary to optimise the performance of these weapons. Under Sea Warfare. FSU User Requirements are for detection of and defence against a torpedo launched at the ship. Frigates' sensor-sharing capability will usually deter a submarine from undertaking surveillance near the ship. Support to Joint Task Force (JTF). The *Defence White Paper 2010* emphasised the NZDF being able to respond to security events in the Pacific region and further afield into Asia. NZDF frigates have an important role to provide defence for a task group and to provide multi-source high quality surveillance and reconnaissance data.

NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations.

Schedule of Capability Definition Phase

Dates	Duration	Note
June 2007 to February 2009 November 2010 to November 2012	44 months	Work on the project was suspended from about February 2009 to November 2010 pending the outcome of the Defence White Paper.

Expenditure in Capability Definition/ Source Selection Phase

	Expenditure (NZ$)	
Life of Type Study	N/A	
Definition Phase	Up to June 2011 +	$69,772
	2011/12	$604,739
	2012/13	$930,477
	2013/14	$745,290
	Total	**$2,350,278**
Explanation		

History of Cost Estimates in the Capability Definition Phase

Date	2004	2008	2012
Costs (million)	$300	$287-845	354-374
Explanation	The early estimate was based on an assumed scope for the upgrade, before any planning work had been undertaken. The 2008 range included a high end option as a comparator that was not proceeded with.		

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	At Contract Signing	30 June 2018 Forecast/Actual
Date	Around 2010	Ship 1: *Te Kaha* March 2017 Ship 2: *Te Mana* February 2018	Ship 1: May 2020 (forecast) Ship 2: May 2021 (forecast)
Explanation	The new forecast acceptance date at June 2018 reflects changes to the start date for the installation phase of this project, which was agreed in the Installation Contract Change Proposal signed in December 2017.		

ACQUISITION PHASE

Description of acquisition work

On 6 November 2012 the Cabinet Committee on State Sector Reform and Expenditure Control authorised the Secretary of Defence to:

a. Issue Requests for Tender for the lead contractor, supply of components and other items as required to deliver the capability level; and

b. Include in the Requests for Tender an option of acquiring a full combat inventory of missiles.

How Defence decided to acquire the Capability Solution

Requests for Tender were issued in February 2013. Evaluation of the five tenders for the Combat System Integrator (CSI) resulted in a clear preferred supplier. Two respondents offered a baselined[3] solution that was approximately 15 – 20% less expensive than the other three. The higher cost proposals would have resulted in a compromise in capability to maintain the total project cost within that agreed to at the Detailed Business Case stage. Of the two lower cost solutions, one tender had a noticeably lower evaluation score, and posed a higher level of project and schedule risk. Conversely, the Lockheed Martin Canada (LMC) tender was a thorough response with a lower level of risk reflective of FSU being an extension of LMC's existing Halifax Class Frigate upgrade for the Royal Canadian Navy.

A number of preferred Original Equipment Manufacturers (OEMs) were also evaluated and identified as being able to provide the stand-alone systems not offered by the CSI, but which are required to meet the level of capability directed by Cabinet.

On 14 April 2014, Cabinet approved the Project Implementation Business Case and authorised the Secretary of Defence to award contracts to LMC and others as required for equipment and services not forming part of the LMC contract. Cabinet approved NZ$446.193 million of capital expenditure for the acquisition and introduction into service of the FSU project (based on foreign exchange rates as at 1 April 2014). This included up to $20 million as a special contingency against risk in the design and installation stages.

In December 2017, following the detailed design phase of the project identifying higher than expected installation costs for the project, Cabinet authorised the Secretary of Defence to commit and approve additional expenditure of $148 million for the Frigate Systems Upgrade project bringing the total approved budget to $639.0 million. A contract change proposal for the installation phase was signed with Lockheed Martin Canada in December 2017. The project schedule and costs have been re-baselined to reflect these changes.

Contract Status (as at 30 June 2018):

Prime contractor	Lockheed Martin Canada

[3] In order to evaluate on an equitable basis, responses were baselined by adding or subtracting components and costs from the responses where they differed.

FSU PROJECT BUDGET

Approved budget and expenditure at 30 June 2018

	Total (NZ$ million)
Approved budget	639.0
Life to date expenditure	385.2
Total forecast expenditure	607.8
Gross project variation (forecast)	31.2
Foreign exchange impact	(31.0)
Actual project variation (forecast)	0.2

Budget variation (original/current)

	Date Approved	Total (NZ$ million)
Original budget at Approval to Commit	14 April 2014	446.2
Current approved budget	6 December 2017	639.0
Variation on original approved budget		192.8

Explanation of major budget variations

Date of individual variation	Total (NZ million)	Explanation
16 November 2015	44.8	Additional NZ$44.8 million approved as a non-cash technical adjustment for FX movement 2015 October Baseline Update
6 December 2017	148.0	Additional $148 million funding approved to complete equipment installation.

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure (cumulative)	385.2
Remaining balance of approved budget	253.8
Forecast commitments	222.6

Total forecast expenditure

	Total (NZ million)
Approved Budget	638.9
Total forecast expenditure	607.8
Gross project variation (forecast)	31.2
Foreign exchange impact	(31.0)
Actual project variation (forecast)	0.2

Nature of variation (forecast)	Total ($million)	Explanation
Actual project variation	31.2	Foreign exchange impact
Foreign exchange impact	(31.0)	
Total	0.2	

Project Contingency as at 30 June 2018

	Total (NZ$ million)
Contingency built into the budget	26.0
Total contingency expended	0
Remaining Balance	26.0

SCHEDULE/TIMEFRAME PROGRESS

Variations in forecast acceptance date

		Original forecast at Approval to Commit	30 June 2018 Forecast/Actual	Variation (months)
Acceptance Date	Ship One	March 2017	May 2020 (Forecast)	38
	Ship Two	February 2018	May 2021 (Forecast)	39
Comment		The initial schedule estimates were made at the time the Project Implementation Business Case was submitted. At the time the contract was awarded, the dates were firmed up as much as they could be prior to the completion of the preliminary and detailed designs. Following completion of the detailed design phase, approval for additional funding and a		

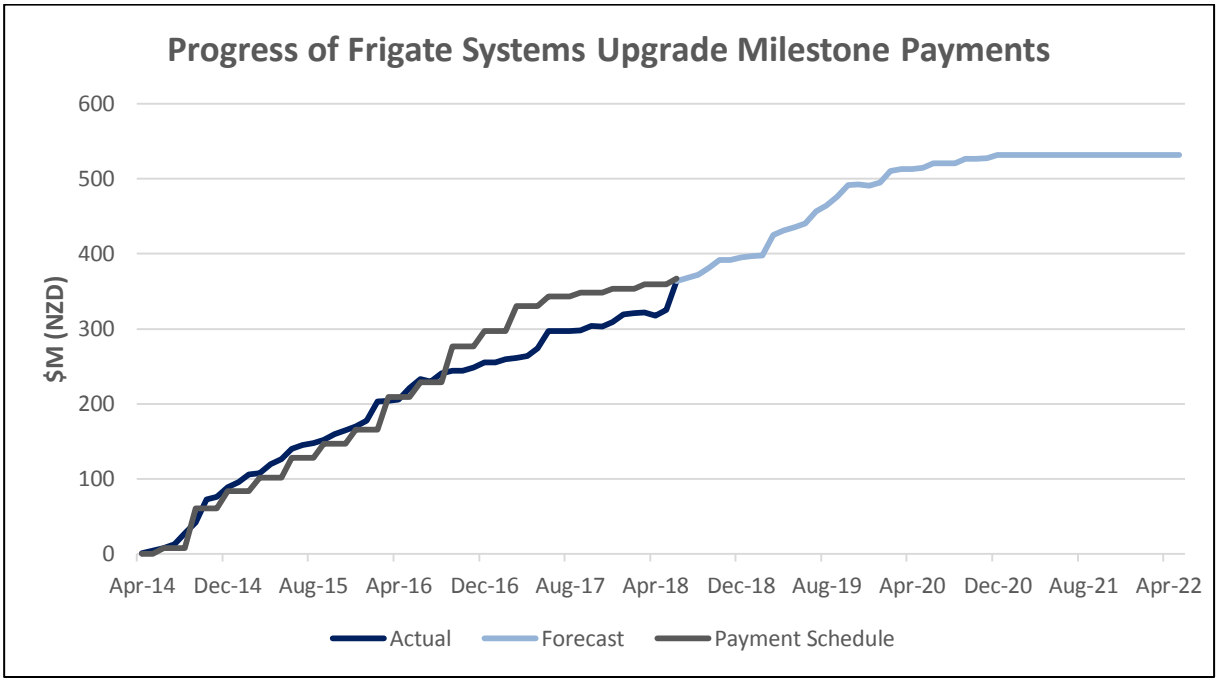
	re-baselining of the schedule was received from Cabinet in December 2017. The June 2018 Forecast reflects the re-baselined schedule, including revised installation start dates of May 2018 for Ship 1 (*Te Kaha*), which was achieved, and May 2019 for Ship 2 (*Te Mana*).

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
6 December 2017	38	Ship One: the forecast variation to the acceptance date as a result of the re-baselining of this project in December 2017. Completion of the Detailed Design for the installation phase had identified that a revised schedule was required.
6 December 2017	39	Ship Two: as with Ship One, the new acceptance date was set as a result of the project's schedule re-baselining in December 2017.

Progress of Anzac Frigate Systems Upgrade against the Milestone and Ancillary Payments Schedule[4]

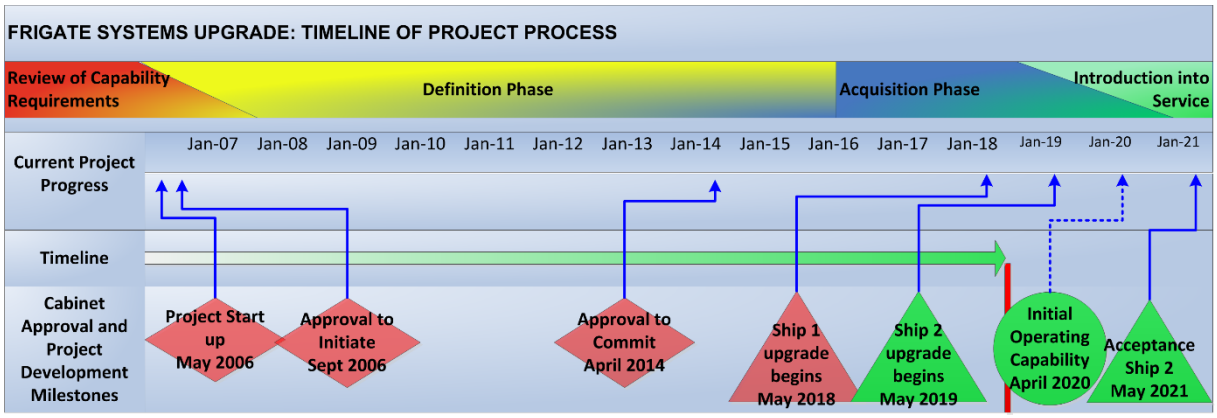
NOTE: This displays the project's progress by comparing actual milestone payments against the milestone payments schedule agreed to in the prime contact. Milestone payments are made upon the contractor's provision of key deliverables and are therefore a good way to identify timing and size of schedule slippage.



FSU PROJECT STATUS AS AT 30 JUNE 2018

	Capability: Preparation for Initial Crew Training for Operators was completed successfully, enabling training to commence as scheduled on 9 July 2018. Other Capability Integration tasks are progressing well.
	Schedule: The installation phase of the project commenced on 1 May 2018 as per the agreed contractual milestones and within the revised baseline schedule that was approved in December 2017.
	Cost: The project is performing within approved budget allocations.

[4] This graph represents the Prime contract and Ancillary contract. It does not include the $12 million Project Management or the $26 million contingency.



DEVELOPMENTS POST 30 JUNE 2018

The project continued with the refit of *Te Kaha* with the industrial phase, which involved removal of old equipment and fitting and installation of new equipment, cabling and systems, and the fitting of new masts. In June 2019 the completion date for the industrial refit was adjusted to October 2019, a four month variation that reflects the complexity of the upgrade and the extent of differences between the Halifax- and Anzac- class frigates. This will lead to an acceptance of Initial Operational Capability in September 2020.

Te Mana has arrived in Victoria, Canada to prepare for the industrial refit, which is scheduled to commence on 1 May 2019. The upgrade of the second ship remains on schedule for acceptance in May 2021.

FSU INTRODUCTION INTO SERVICE PHASE

Description of Introduction into Service Phase

An Introduction into Service Plan has been developed to coordinate the test and evaluation processes required to bring the upgraded frigates back into operational service.

The main activities will be:

Engineering change process: The overarching framework against which Introduction into Service will be conducted is the RNZN Engineering Change Process. This is a well-established structured process which ensures all elements are completed.

Data Management and Documentation Deliveries: documentation delivered by the contractors will be reviewed and then entered into the Logistic Information Management System.

Acceptance Testing: Acceptance testing will be based on the Royal Australian Navy (RAN) Test and Evaluation procedures. Testing will include Factory, Harbour and Sea Acceptance Tests. Acceptance testing of the Sea Ceptor missile system will include a significant amount of modelling analysis that will be achieved through collaboration with partner navies. The first ship to be upgraded will need to meet sufficient test requirements to attain an Initial Operating Capability prior to the second ship entering the installation phase.

Operational Test and Evaluation: will be conducted by the NZDF in order to satisfy that the delivered suite of products meets the original intent. Additionally it baselines the delivered systems and identifies its capabilities and limitations.

Training: Three types of training deliverables will be provided; training systems, training data/documentation and training courses. These deliverables will be managed by the project's ILS manager liaising with the end users.

Leveraging Partner Defence Force Relationships: In order to both meet system requirements and provide through life support, arrangements will be leveraged with partner defence authorities. Implementation Arrangements are now in place with both Canada and the UK.

Prior to Introduction into Service, safety case data will be provided by the FSU Project to allow Defence to raise relevant safety cases for approval by the Naval Capability and Armament Certification boards as appropriate. Similarly, prior to classified data being held on any delivered system, the system must be certified to recognised security standards.

Schedule of Introduction into Service

	Initial Estimate	30 June 2018 Forecast/Actual	Variance (months)
Date Platform accepted by Crown	Ship 1 March 2017 Ship 2 February 2018	Ship 1: *Te Kaha* May 2020 (Forecast) Ship 2: *Te Mana* May 2021 (Forecast)	38 39
Achieve Initial Operational Capability	May 2017	April 2020 (Forecast)	35
Commence Operational Test and Evaluation	May 2017	May 2021 (Forecast)	48
Finish Operational Test and Evaluation	February 2018	September 2021 (Forecast)	43
Full Operational Capability	TBC	September 2021 (Forecast)	-
Explanation	The initial schedule estimates were at the time of submitting the Project Implementation Business Case. A contract change proposal for the installation phase was signed with Lockheed Martin Canada in December 2017 post Cabinet approval of additional funding. The project schedule has been re-baselined to reflect these changes. Unless stated, all dates are for Ship 1 only.		

FSU OPERATIONAL CAPABILITY

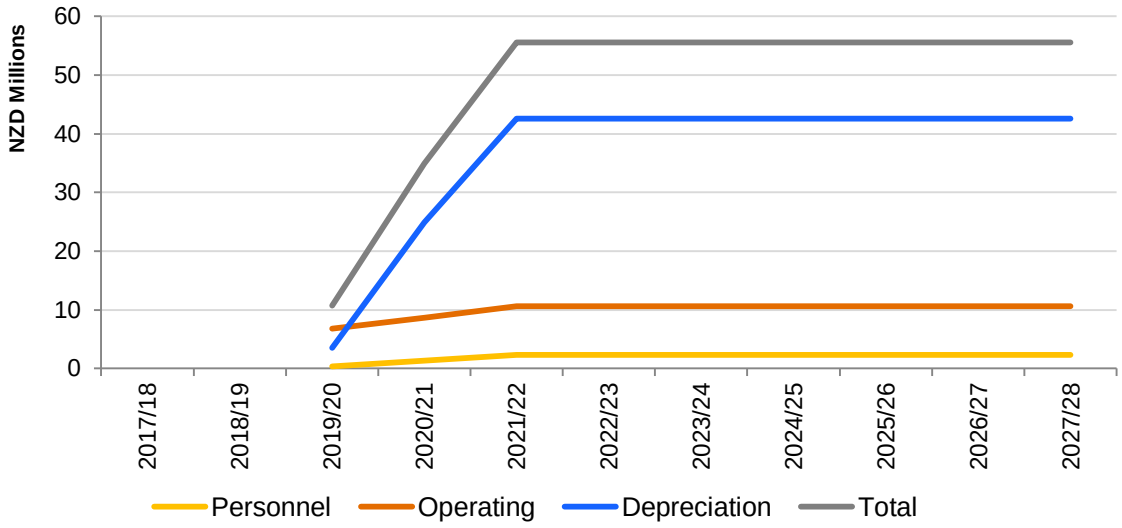
Progress towards Delivery of Operational Requirements as at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

Operational Requirements	Requirement likely to be met	Explanation
Combat Management System (CMS)	Yes	The Lockheed Martin CMS 330 represents a significant upgrade over the current system that will integrate all the necessary sensors being provided under FSU.
Intelligence Systems	Yes	Both Radio and Radar electronic support measures will be enhanced by the provision of separate systems that will bring the Signals Intelligence capability up to date.

Operational Requirements	Requirement likely to be met	Explanation
Radar Systems (Surveillance and Reconnaissance)	Yes	Provision of Thales SMART S 3 Dimensional Multi Function Radar and SharpEye surface surveillance radar will address obsolescence issues and provide systems capable of detecting modern threats.
Optronics (Surveillance and Reconnaissance)	Yes	A Sagem Vampir Infra Red Search & Track (IRS&T) system will provide additional surveillance plus target indication for the air defence missile system.
Air Defence	Yes	The Sea Ceptor active missile system will provide state of the art defence against the latest types of anti-ship missile.
Anti-Surface	Yes	The new surveillance sensor package combined with improved Command and Control will improve the ship's ability to defend itself against asymmetric surface threats. A new 5 inch gun control system will contribute to this as well as providing additional flexibility for Naval Fire Support to troops ashore.
Under-Sea Warfare	Yes	Modernisation of the Hull Mounted Sonar (HMS) will significantly enhance performance of the detection and tracking of submarines. The introduction of the Sea Sentor Torpedo Defence system will provide for the first time the ability to detect, classify and track torpedoes whilst responding with an integrated set of defensive measures.
Support to Joint Task Force	Yes	The overall upgrade will generate an escort that is capable of maintaining a presence in a contemporary threat environment. It will be able to significantly contribute to the Intelligence, Surveillance and Reconnaissance objectives of a task force commander and provide local area air defence to high value units.
Contracts to achieve all of the above operational requirements have been awarded. Benefits realisation is scheduled for full implementation in 2021.		

Summary of Anzac FSU Through Life Operating Cost Estimates



INDIVIDUAL WEAPONS REPLACEMENT

Project Description: The Individual Weapons Replacement project is nearing completion, with the replacement of the New Zealand Defence Force (NZDF) 5.56mm Steyr rifle and the 40mm grenade launcher with a new individual weapon and grenade launcher. The Modular Assault Rifle System – Light (MARS-L) is being introduced.

THE PURPOSE OF THIS PROJECT

The primary tool for all military personnel, whatever their specialisation, is their individual weapon. The Individual Weapons Replacement (IWR) project sought to replace the 18,000 Steyr rifles that had been introduced into service over a period spanning 1987 to 1991.

Their original planned 'life of type' was through to 2011, although that expectation was exceeded, in part because the quantity originally procured was greater than was required over time. While this allowed progressive retirement of 8,000 rifles, this reduction increased the wear on the remaining stock.

The IWR project was founded on the need for an ability to deploy rapidly in task groups tailored to deployment-specific requirements. The benefits are, in summary:

- an increased ability to effectively detect, recognise, identify and engage targets
- increased individual weapon fleet reliability and operator confidence.

In practical terms, these benefits lead to increased soldier performance, which in turn leads to better operational performance. Those using the weapons are confident in knowing that their rifle is modern and reliable. They are able to over-match their opponents, and reduce the risk of engaging the wrong targets. This generates a higher likelihood of mission success.

CAPABILITY REQUIREMENTS

The capability requirements sought include:

- an individual weapon that, when fitted with a suitable sight, allows the detection, identification and effective engagement of adversaries at all ranges out to at least 600 metres by day and 300 metres by night.
- an individual weapon that is effective in all military operations by day and night in all weather and all environments (including alpine, desert and marine) for prolonged periods.
- an individual weapon that is able to be used in accordance with NZDF concepts of use and training techniques and procedures.

IWR Better Business Case Milestones

Date	Approved By	Nature of Approval
7 March 2014	Capability Management Board	**Project Charter.** Co-signed approval of Individual Weapon Replacement by the Secretary of Defence and the Chief of Defence Force.
27 May 2014	SEC Min (14) 9/2	**Single Stage Business Case.**[5] Cabinet's committee on State Sector Reform and Expenditure Control approved the Business Case under a power to act (ref CAB Min (14) 18/22).
7 December 2015	CAB-15-MIN-0272	**Project Implementation Business Case**. Cabinet authorised the Secretary of Defence to conclude a contract with Lewis Machine Tool Company.

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

Continuous operational experience with the Steyr had highlighted key issues. The greatest deficiency was the ability to effectively detect, recognise, identify and engage targets at requisite ranges. Improving this required advanced sighting systems, which could not be fitted to the Steyr as its closed design architecture does not allow this.

In addition, as rifles age, reliability decreases, which can affect the confidence of military personnel in their weapon. This issue was not unique to Steyr – all rifles that are well-used will wear over time and because of this, and to benefit from technology advances, the NZDF has replaced its rifles approximately every 20 years.

The major technical advance in military rifles over the last 20 years has been the move to 'open architecture'. This allows for the easy mounting, optimisation and replacement of sophisticated sights (both day and night), along with other ancillaries such as laser aiming devices. These give much greater accuracy and allows the intrinsic capability of the rifle to be effectively exploited across the full range of combat situations.

A parallel advance in rifle technology is the ability to make the rifle adaptable for different body sizes and the wearing of different personal equipment such as body armour. A rifle that can adjust to different users is easier for the individual to have confidence in and use effectively.

Both the lack of, and desirability of, these characteristics has been reinforced over the last decade of operational experience. This is especially so in Timor-Leste and Afghanistan, where New Zealand service personnel have been exposed to current combat conditions.

These issues had been recognised, a partial upgrade of 385 Steyr rifles took place over 10 years ago. Because of their better combat attributes, these particular rifles had been used more intensively than others, both for operations and training (as it is desirable to train using

[5] For low-risk projects Treasury Better Business Case guidance recommends combining the Indicative and Detailed Business Cases in to a Single Stage Business Case.

the configuration of rifle that will be used on operations). As a result they were wearing faster, and were at greater risk of failure, than the unmodified rifles.

A longer-term approach to tackling the known performance issues with the Steyr was first articulated in 2007. At that time the NZDF initiated the in-service weapon replacement and upgrade programme [CAB Min (08) 36/2]. The proposed solution for the Steyr was to comprehensively upgrade 3,000 rifles. This was intended to carry the fleet through until about 2018, when full replacement was planned to commence. Although early responses from the market indicated that this was achievable, a formal Request for Tender process undertaken in 2012 failed to solicit any viable upgrade proposal.

Careful analysis of both the current market, and individual weapons under development, confirmed that there was no advantage in waiting to replace the Steyr. Western militaries remain committed for the foreseeable future to the current standard military ammunition calibre (5.56mm for individual weapon rifles and 7.62mm for more specialised weapons that deliver heavier firepower).

How Defence analysed the requirements options in the Capability Definition phase

The options examined were:

- addressing the age and capability gap of the current individual weapon fleet through upgrading existing rifles
- finding an alternative to a rifle as an individual weapon
- delaying the project
- trade price for performance
- full versus partial fleet replacement
- weapon fleet size to meet 20 year operational effectiveness.

In evaluating the options, the overall assessment criteria set out below were used. They are graded as low, medium or high. As any option must be both a strategic fit and be achievable, these mandatory considerations were not included in the evaluation.

Criteria	Description
Efficiency	Does the option minimise resource impacts (time, money, skills and people)? Is efficiency improved or, at minimum, maintained?
Effectiveness	Does it maximise combat effectiveness in the simplest way?
Affordability	Can it be done within planned capital and operating allocations?
Sustainability	Is overall effectiveness maintained for the life of the individual weapon fleet?
Value	Is the NZDF getting the best value for money?
Risk	What is the possibility that the project will not proceed as planned?

- Addressing the age and capability gap of the Steyr individual weapon fleet through upgrading existing rifles was eliminated as an option, as the earlier project to achieve this was unable to deliver a feasible solution.
- Delaying the project was eliminated as an option. The capability shortfalls had been identified. The Chief of Army had stated on more than one occasion that should a

medium/large operational deployment for anything other than a low intensity situation arise, an urgent operational requirement for a contemporary rifle would need to be undertaken.

- There was no real ability to trade price for performance, as there was a minimum performance standard below which the rifle would be unacceptable from a risk perspective. This option was eliminated.

The options analysis (see table *Requirements Analysis in the Capability Definition Phase* on page 42) was therefore confined to an examination of a full versus partial fleet replacement, and the quantities required.

Overall Conclusion

Based on the options analysis, it was recommended that the entire fleet be replaced and the legacy Steyr rifles be disposed of as soon as the new fleet is in place. The recommended size of the new fleet was 8,800 rifles.

It should be noted that the Single Stage Business Case had as out of scope an assault rifle fleet for Special Operations Forces unless the Individual Weapons Project matched the Special Forces user requirements.

The selected individual weapon did match the Special Operations Forces user requirement, and the final acquisition and funding reflects this.

How Defence considered interoperability

Defence had previously considered the Australian Defence Force Thales F90 proposed future rifle in lieu of an upgrade. This approach was not supported, however, because:

- the cost of 3,000 new rifles was considerably higher than the amount approved
- the F90 was not going to be produced and fielded within the stipulated timelines
- the F90 was not actually in-service and proven.

Defence considered the calibre of the future individual weapon. It was determined that it would remain the NATO standard 5.56 mm. Interoperability was not held to be a risk.

The Trijicon advanced combat optical gunsight was pre-selected as it is currently in service with the NZDF.

User requirements set out in the Request for Tender specified a proven, in-service system.

How Defence considered through-life costs and issues

In comparison with the Steyr rifle, the introduction of the replacement – the Modular Assault Rifle System - Light (MARS-L) rifle – was selected in part because of the reduction in maintenance costs that would result. Ammunition costs (which are the largest consumable) remain constant.

The overall weapons training approach does not alter. Given that military personnel use a rifle as a basic professional tool, the transition from one to another is straightforward. The basic principles of operation and use remain the same.

Operating costs were summarised in the Single Stage Business Case and updated for the Project Implementation Business Case. No additional operating funds are required with all operating costs intended to be met from current and approved projected baselines.

The impact on both depreciation and capital charge were already included in Defence's four year operational funding plans and long-term operational funding projections.

The Whole-of-Life costs are calculated as follows:

	NZD ($ million)
Initial Capital Investment	$59.234
Total Capital	$59.234
Operating Expenses	$56.400
Depreciation	$59.234
Whole-of-Life Cost	$115.634
Whole-of-Life Cost (Net Present Value)*	$81.970

*Discounted at 8% and useful life of 20 years

Requirements Analysis in the Capability Definition Phase

Options considered	Cost Estimate (NZ$ million)	Advantages	Disadvantages
Partial fleet replacement	In short term, within overall budget – longer term uncertain	Lower cost (cost not fully developed as operational disadvantages outweighed potential cost savings, especially over a whole-of-life)	Split fleet (support, maintenance and training issues), uncertainty over how balance will be replaced and whether future fleet would be identical.
11,000 total individual weapons	Greater than approved $58.4 million	Nominally one rifle for every uniformed person in the NZDF (including all Reserves).	Actually, only about 5,000 personnel would have a rifle at peak demand. Not everyone will need a rifle simultaneously. Costs of managing an excessive fleet are high.
16,000 total individual weapons	Greater than approved $58.4 million	Nominally one rifle for every uniformed person in the NZDF (including all Reserves) and allowances for attrition over time.	As above.
7,000 total individual weapons	Within $58.4 million	Based on actual numbers. Includes modest maintenance and attrition pool. Lowest capital cost, does not utilise people and money managing a very large fleet, and maintaining unnecessary spares holdings.	Risk over life of type.
8,800 total individual weapons	Within $58.4 million	As above. Experience has suggested that around 45% of strength could be depleted over life of type, so allows for this. Within capital cost, does not utilise people and money managing a very large	No disadvantage within projected future Army size.

Options considered	Cost Estimate (NZ$ million)	Advantages	Disadvantages
		fleet, and maintaining unnecessary spares holdings best manages life of type availability risk.	
ASSESSMENT: On the basis of benefit delivery, meeting of requirements and managing availability risk, the 8,800 individual weapons option was selected.			

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:	**Operational Requirements** necessary to support the capability include:
• Increase ability to effectively detect, recognise, identify and engage targets; • Increase individual weapon reliability and operator confidence.	• When fitted with a suitable sight, allows detection, identification and effective engagement of adversaries at all ranges out to at least 600m by day and 300m by night • Is effective in all military operations by day and night in all weather and all environments (including alpine, desert and marine) for prolonged periods; and • Is able to be used in accordance with NZDF concepts of use and training techniques and procedures.
NOTE: The user requirements on the Request for Tender specified in greater detail how these operational requirement would be met.	

Schedule of Capability Definition Phase

Dates	Duration	Explanation
7 March 2014 – 7 December 2015	21 months from Charter to Project Implementation Business Case approval by Cabinet	The interval between Single Stage Business Case and Project Implementation Business Case Cabinet decisions was 19 months. This interval allowed for: • a two part tender process (RFP/RFT) • evaluation and down-select of 14 initial responses • comprehensive in-country trials and evaluation of eight contenders, (including all ancillaries) • contract negotiations with preferred provider.

Expenditure of Capability Definition/Source Selection Phase

	Capital Expenditure (NZ$ million)	
	2015/16	$15.539
Explanation	Cabinet approved $0.440 million of pre-acquisition costs in May 2014 and $59.234 million of capital expenditure in December 2015.	

History of Cost Estimates in the Capability Definition Phase

Date	2014	2015
Capital Costs ($NZ million)	$58.4	$59.2
Explanation of variance	Slight variance due to additional rifles being purchased for Special Forces. Variance was funded via an allocation from the Special Operations Forces Weapons budget.	

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial Estimate	At contract signing	30 June 2018 Forecast/Actual
Date	March 2016	July 2017	October 2017 (Actual)
Explanation of variance	The final Cabinet approval was made in December 2015. Contracts were finalised in December 2015. Time has been allowed for robust quality assurance and acceptance measures.		

ACQUISITION PHASE

Description of acquisition work

As part of the business case approval, Defence received approval to approach the market with a Request for Tender. This was issued on 14 August 2014 with a deadline for response of 12 November 2014.

Eleven companies responded, and eight responses were evaluated as compliant and were recommended to go through the trial evaluation process. All eight companies provided weapons for evaluation.

The trials took place over three months and involved a comprehensive range of tests including both practical firing and technical analysis.

Overall, the evaluation had three broad streams:

- Technical testing – including aspects such as inherent accuracy at various ranges, actual motion and dynamics (for example, recoil and muzzle jump on firing), muzzle flash, noise levels, weight distribution.

- User testing – including overall usability of both the rifle, the rifle/grenade launcher combination, and the grenade launcher in ‘stand-alone’ mode, and the results of comprehensive shooting trials.

- The overall commercial package, including in service support arrangements, price, and technical and service information compliance.

Lewis Machine & Tool Limited (LMT) was the clear choice across the full range of user trials. It met the technical evaluation and was within the fiscal envelope allowed. An added benefit was that the LMT grenade launcher was also preferred. This meant that the overall solution was a 'turn-key' solution from one provider, rather than having to consider matching a rifle from one provider and a grenade launcher from another.

Due diligence was undertaken on LMT by the Ministry of Defence and through an independent evaluation.

The major contract is a commercial purchase of the rifles, parts, a two year spares package, along with nominated ancillaries and services from LMT.

In addition to the overall contract, the project includes the modification of armouries and other infrastructure across the Defence Force; project management and an allowance for simulation. Logistic Support is part of the overall package. Maintenance arrangements are in line with current provision.

Two components of the overall weapons system - the primary x4 power sight and the combat torch - are contracted direct from their respective suppliers (Trijicon for the sight, and Quality Imports NZ Ltd for the combat torch). Both these components are standardised in service already. The tender requirements stipulated that these components be integral to the overall system.

Overall, project governance and management is in accordance with approved Capability Management Framework practices.

Contracts: Status as at 30 June 2018

Individual Weapon

Contractor – Lewis Machine & Tools Inc USA - Signed 23 December 2015.

Deliverables:

Delivered in 4 tranches, all Tranches were subjected to factory acceptance tests which were completed and all weapons passed as being fit for purpose. Tranche 1 weapons were delivered and accepted in October 2016, Tranche 2 weapons were delivered and accepted in March 2017, Tranche 3 weapons were delivered and accepted in August 2017 and Tranche 4 weapons were delivered and accepted in October 2017.

Warranty: Following an investigation into premature breakages of the firing pin, the company agreed that the firing pins appeared to not have been "hardened" properly and replaced all firing pins at no cost to the Crown.

Advanced Combat Optical Gunsight (ACOG)

Contractor – Trijicon, Inc. USA – Signed 18 December 2015.

Delivered in 7 tranches – from May 2016 to November 2016. All sights have been delivered and accepted.

Warranty: During the Train the Trainer component, a flickering fault with the RMR 06 sight was detected. The Crown raised a warranty claim, which was accepted by the contractor who undertook and completed the remedial work in February 2018.

Combat Torches

Contractor – Quality Imports Limited New Zealand – Signed 21 December 2015.

Delivered in one batch on 28 June and accepted on 8 July 2017.

IWR PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	59.2
Life to date expenditure	48.9
Total forecast expenditure	57.2
Gross project variation (forecast)	2.0
Foreign exchange impact	(1.1)
Actual project variation (forecast)	0.9

Budget variation (original/current)

	Date Approved	Total (NZ$ million)
Original budget	2 December 2015	59.2
Variation on approved budget		0

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure	48.9
Remaining balance of approved budget	10.3
Forecast commitments	8.3

Total forecast expenditure

	Total (NZ$ million)
Approved budget	59.2
Total forecast expenditure	57.2
Gross project variation (forecast)	2.0
Foreign exchange impact	(1.1)
Actual project variation (forecast)	0.9

Variance explanation

Nature of variation (forecast)	Total (NZ$ million)	Explanation
Actual project variation	2.0	Underspend in ancillary projects
FOREX Impact	(1.1)	Foreign exchange impact
Total	0.9	

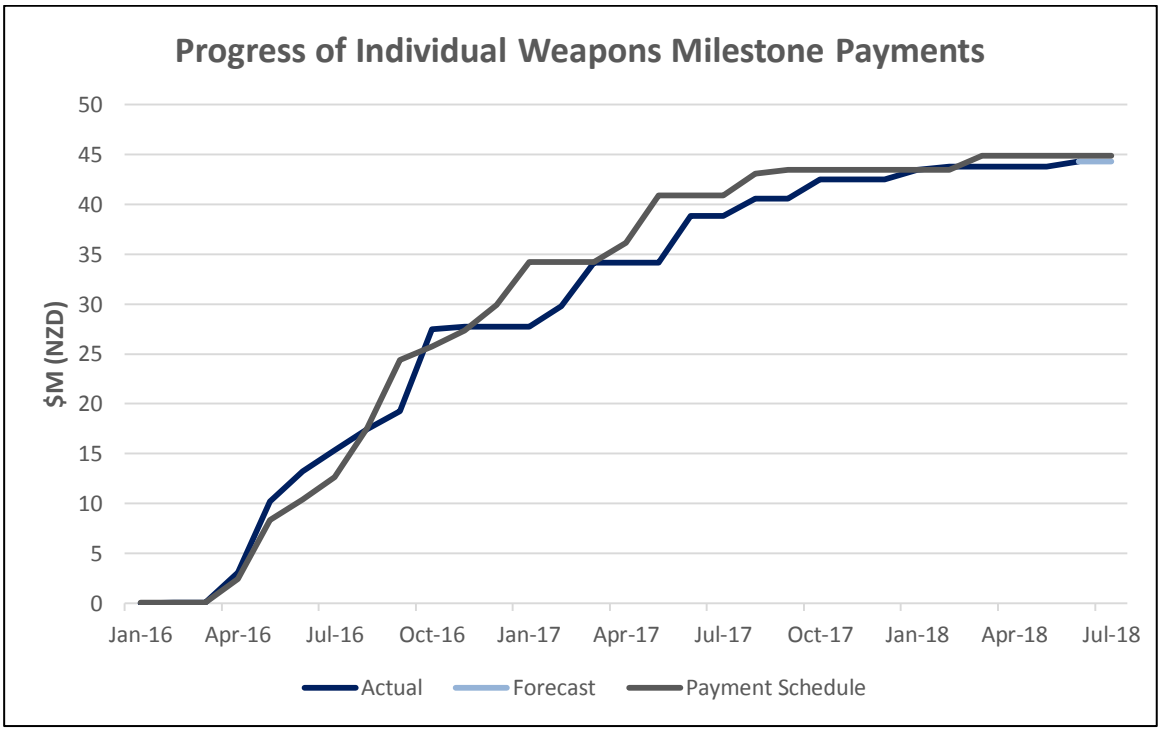
Project contingency as at 30 June 2018

	Total (NZ$ million)
Contingency	2.7
Total contingency allocated	0.7
Remaining balance	2.0

Explanation of major contingency draw downs

Draw down	Total (NZ$ m)	Explanation
December 2017	0.7	Procurement of additional spares and equipment
Total	0.7	

Progress of Individual Weapons Replacement Milestone Payments



SCHEDULE/TIMEFRAME PROGRESS

Variations in forecast acceptance date

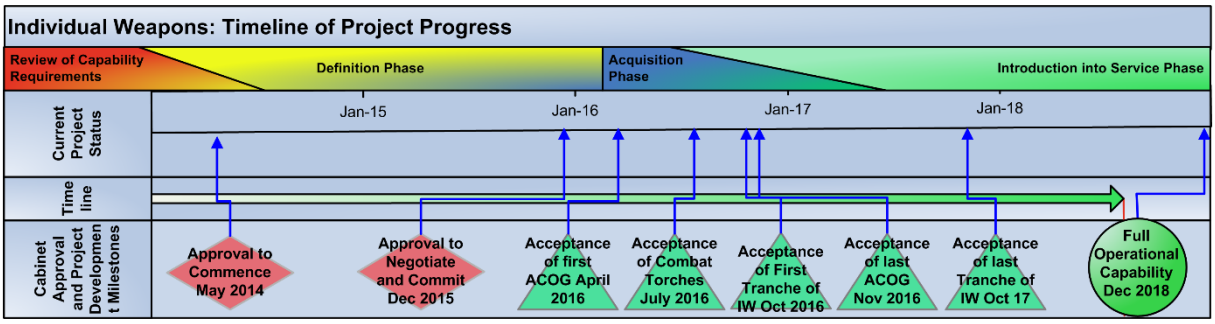
		Original forecast at Contract Signing	30 June 2018 forecast/actual	Variation in Acquisition phase (months)
Acceptance Date	Individual Weapon Final	July 2017	October 2017 (actual)	3 months
	Advanced Combat Optical Gunsight Final	November 2016	November 2016 (actual)	nil
	Torches	August 2016	July 2016 (actual)	nil

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
October 2017	3 months	Delay in obtaining the necessary export approvals from the US Government and a re-calculation of production/delivery dates from LMT to cover off manufacturing processes.

IWR PROJECT STATUS AS AT 30 JUNE 2018

	Capability: Capability delivery and acceptance of the MARS-L, ACOG gunsights and combat torches has occurred. A formal handover ceremony for the project was held at Trentham Military Camp in early December 2017 and the introduction of the new weapons has seen an improvement in shooting standards. Results of the Annual Weapon Qualification shoot has seen an overall increase in the general standard pass rate, and a doubling of the number of personnel achieving top/marksman grade.
	Schedule: All tranches for Individual Weapon, Advanced Combat Optical Gunsight and Combat Torches were delivered in accordance with contracted milestones. Some key projects dates were reporting behind the original baseline but with no impact on overarching governance milestones.
	Cost: The project budget is on track and remains within the Cabinet approved appropriation.



DEVELOPMENTS POST 30 JUNE 2018

The Individual Weapon capability achieved Interim Operational Release without limitations and was deployed on operations during the second quarter of 2018. In November 2018 Full Operational Release was sought and is going through Defence's formal review process. The New Zealand Army's 2018 Annual Weapon Qualification Shoot compared results since the MARS-L was introduced with those achieved using the Steyr, which indicated an overall increase in the general standard and doubling of the achievement of Marksman (top) grade.

INTRODUCTION INTO SERVICE

Description of Introduction into Service phase

Maintainer training commenced in March 2016. It was conducted at the LMT facility in the US. Maintainers drawn from all services, received training from the manufacturer, then, while still in the United States, conducted a factory acceptance test on the first tranche. Those maintainers then conducted cascade training for the remaining maintainers. This has coincided with delivery site acceptance testing of each tranche.

As all active personnel involved in weapons training are already familiar with multiple weapon types, no particular challenges were envisaged with the introduction of either the rifle or its key ancillaries (which were also already in operational service within Defence, albeit on not such an extensive scale). The project includes rifles and grenade launchers specifically adapted for use in the mobile and static weapons training systems simulators, simulation training, and simulation testing and documentation.

Operator training commenced in October 2016, conducted by LMT instructors. Ten weapon instructors were drawn from all services. These instructors have been conducting cascade training throughout the main camps and bases in New Zealand, with phase 1 of the initial training completed in April 2017.

It should be noted that, should operational circumstances require accelerated release, priority will be given to operationally tasked personnel and appropriate pre-deployment training provided on the Modular Assault Rifle System - Light (MARS-L).

Racking in armouries (including aboard ships) is included in the project and a specific infrastructure allocation is allowed. Armoury modifications will be undertaken as the rifles are delivered. Rifle rack requirements within operational vehicles are being determined, with the project to undertake modifications to vehicles within the overall infrastructure allocation.

Status of Introduction into Service phase

The Introduction into Service concept document was presented to the Project Board in August 2016 (This was used to prepare the detailed introduction into service plan). The Introduction into Service plan was released by the Project Board in October 2016.

SCHEDULE OF INTRODUCTION INTO SERVICE

	Initial estimate	30 June 2018 (Forecast/Actual)	Variance
Maintainer training commences	March 2016	April 2016 (Actual)	1 month
Operator training commences	October 2016	February 2017 (Actual)	4 months
First issue to users	November 2016	February 2017 (Actual)	3 months
Issue complete	November 2017	November 2018 (Forecast)	12 months
Full Operational Test & Evaluation complete	June 2018	November 2018 (Forecast)	5 months
Explanation	Delay in obtaining the necessary export approvals from the US Government and a re-calculation of production/delivery dates from LMT to cover off manufacturing processes. Full Operational Test and Evaluation is proceeding through the NZDF approvals process.		

IWR OPERATIONAL CAPABILITY

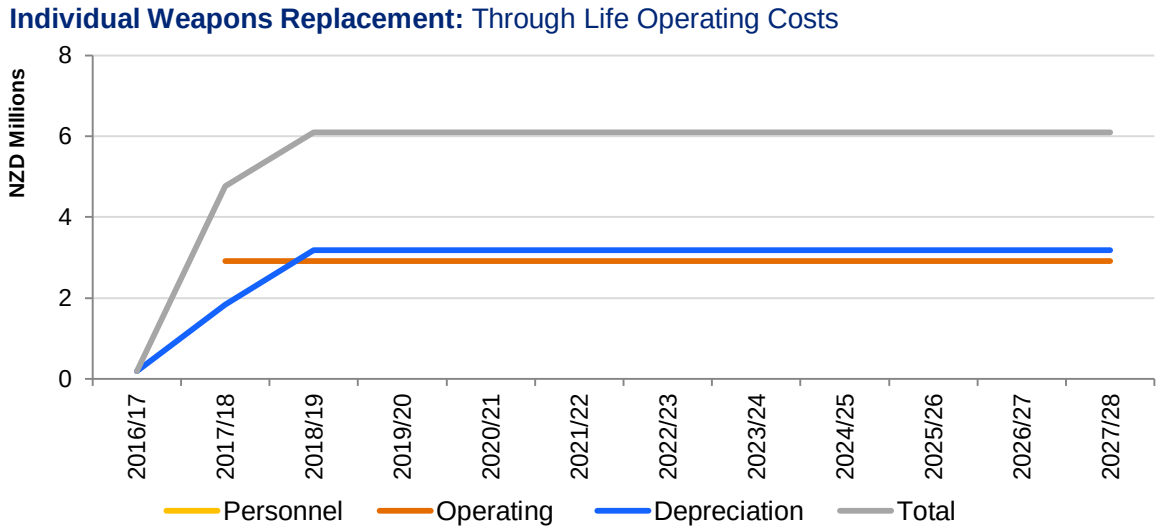
Progress towards Delivery of Operational Requirements as at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

Operational Requirements	Requirement likely to be met	Comment
Increased ability to effectively detect, recognise, identify and engage targets	Yes	The rifle has an open architecture to allow additional equipment to be fitted.
Comply with current safety regulations	Yes	The individual weapon safety case is being scoped.
Improve ability to monitor usage rates.	Yes	Fitment of radio frequency identification tags that enable usage to be electronically recorded.
Commonality across NZDF	Yes	All services are being issued with the same type of weapon.
Proven in Service	Yes	Supplied to military and police organisations.
Proven supply chain	Yes	Contractor has representatives in NZ and has entered into a support contract with the NZDF.

Operational Requirements	Requirement likely to be met	Comment
Supportable within current NZDF trades and resources	Yes	The Introduction into Service Plan included conversion training for maintainers and initial train the trainer for operators.
Value for money	Yes	The cost model in the Implementation Business Case demonstrates this.
Benefits realisation is scheduled for full implementation by 2020.		

Summary of IWR Through Life Operating Cost Estimates



STRATEGIC BEARER NETWORK

Project Description: This project is providing high capacity military satellite communications equipment to the New Zealand Defence Force. This Strategic Bearer Network will access the United States Department of Defense Wideband Global Satellite Communications, a constellation of nine satellites that will enable deployed forces to meet current and future strategic information exchange requirements and meet the growing demand for bandwidth. The Network is made up of two fixed anchor stations and five maritime terminals fitted to the Navy fleet.

THE PURPOSE OF THIS PROJECT

Strategic Bearer Network is an enabling project that supports a number of key Defence Force functions within Land, Maritime and Air domains. The Network is also a key enabler for Command and Control systems such as the Defence Command and Control System (which featured for the last time in the 2017 edition of this report), and Network Enabled Army. This project was set up to enable the Government's options for using the Defence Force for the principal tasks that were set out in the Defence White Paper 2010, in particular:

- to defend New Zealand sovereignty
- to contribute to and where necessary lead peace and security operations in the South Pacific
- to make a credible contribution in support of peace and security in the Asia – Pacific region
- to protect New Zealand's wider interests by contributing to international peace and security, and the international rule of law
- to contribute to whole-of-government efforts at home and abroad in resource protection, disaster relief, and humanitarian assistance
- to participate in whole-of-government efforts to monitor the international strategic environment.

Following the *Defence White Paper 2010* requirement for "Improved Offshore Communications" the NZDF's Strategic Assessment and Investment Concept Brief identified a requirement to improve capacity and access to a wider range of common and reliable communications paths.

Capability Requirements

The capability requirements necessary to support policy objectives include:

- provide a computer network infrastructure with global reach, high capacity and robust design
- enable the Command and Control of deployed forces
- meet the growing demands for information exchange with our deployed forces
- provide greater levels of interoperability with security partners
- provide Value for Money from investment in Satellite Communications.

SBN Better Business Case Milestones

Date	Approved By	Approval
6 July 2011	Project Charter	**Project initiation.** A project charter to initiate the SBN project was approved "to provide global connectivity into the NZDF networks of sufficient capacity and reliability to enable deployed forces to meet information exchange requirements". The project team was directed to write the Indicative Business Case.
19 September 2011	Cabinet CAB Min (11) 9/4	**Approval of Indicative Business Case (IBC).** Following submission of the IBC to Cabinet approval was given to develop a Detailed Business Case (DBC) to examine the recommended three short listed options.
14 November 2011	Cabinet CAB Min (11) 41/13	**Approval of Detailed Business Case (DBC).** Following submission of the DBC, Cabinet confirmed the preferred option was through a Memorandum of Understanding (MoU) with the US DoD Wideband Global Satellite Communications System (WGS). The NZDF was authorised to sign the MOU and the Chief of Defence Force signed this agreement on 4 December 2011. Cabinet also approved capital expenditure of $83.3 million and a contingency of $5.6 million totalling $88.9 million. The preferred option was effectively contracted when the MoU was signed with the US DoD. This included the payment milestones required by the MoU. NOTE a percentage of the capital expenditure was set aside for investing in the NZDF infrastructure necessary to access the WGS satellites. This consists of mobile (land-based) terminals, maritime terminals and fixed anchor stations. The NZDF was to administer the budget for the MoU, and the Ministry of Defence was to administer the budget for infrastructure acquisition.
25 July 2012	Minister of Defence, Minister of Finance SBN financial appropriations	**Approval to Commit (joint note in lieu of a Project Implementation Business Case).** An appropriation of $18.31 million to Vote Defence, Ministry of Defence for Defence Equipment was approved by Joint Ministers. (NOTE a further $14 million for additional purchases in 2022-2025 has not yet been appropriated.) This equipment will be delivered over three tranches.

Date	Approved By	Approval
16 June 2014	Minister of Defence, Minister of Finance SBN financial appropriations	**Approval to Commit (joint note in lieu of a Project Implementation Business Case).** A technical adjustment was made to the existing appropriation to bring forward $8 million of the out-year funding. (NOTE a further $6 million for additional purchases in 2022-2025 has not yet been appropriated.)
11 July 2016	Cabinet Business Committee CBC-16-MIN-0010 SBN financial appropriations	**Approval to transfer funding:** Cabinet Business Committee approved transfer of funding from various projects in the Defence portfolio that had delivered under budget to the Strategic Bearer Network project to complete equipment acquisition.

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

In 2010 Defence began formally considering options for replacing its strategic communications[6].

The NZDF developed an Investment Concept Brief (ICB) and fed this into the Strategic Assessment of the SBN project. This identified problems to be addressed, the alignment with defence policy objectives and the benefits to be derived from investment in strategic communications. These are summarised as:

Problems	Benefits
Inadequate and unreliable networks and systems	More agile and knowledge-led operations
Increasing obsolescence of the communications infrastructure	Improved ability to develop critical future capabilities
Fragmented and ad-hoc network management	Improved value from government investment

The ICB provided the investor (Commander Joint Forces) with sufficient confidence to progress the project.

An initial study was undertaken to identify the scope of the strategic communications required. This analysed NZDF deployments over the previous ten years. It identified the need to:

- support up to six deployed maritime units simultaneously

[6] Strategic communications are generally inter-theatre between deployed units and their Headquarters in New Zealand where access to the services and information on the defence networks is required. Tactical communications are generally intra-theatre between individual units.

- support up to six deployed missions simultaneously (at the time the NZDF was deployed to Afghanistan, Iraq, Middle East, Republic of Korea, Sinai, Solomon Islands, Sudan and Timor-Leste)
- deliver increased capacity to support growing information exchange requirements
- deliver increased capacity to enable the delivery of new services on the network.

The US DoD proposed their WGS system as a potential solution for NZDF strategic SATCOM requirements in a visit to New Zealand in 2010. Once further information was gathered on this proposal, a Project Charter was approved to stand up the Strategic Bearer Network project team to develop the Indicative Business Case.

How Defence analysed the requirements options in the Capability Definition phase

Six options were considered in the IBC, with three of these discarded for not meeting one or more of the investment objectives or critical success factors. The remaining three options were:

- Status Quo, effectively do nothing and included for comparison reasons only.
- Enhanced Status Quo, investigate improving on the current model, adopt better business practices and leverage off improvements in commercial SATCOM.
- WGS, sign the MoU to gain global access to the US DoD-owned SATCOM constellation. This would include the improvements to NZDF practices and procedures.

A Multi-Criteria Decision Analysis (MCDA) was conducted and WGS was identified as the preferred solution. Cabinet approved the IBC and directed Defence to develop a detailed business case to further examine the shortlisted options.

A model was produced of the NZDF demand for SATCOM based on an extrapolation of previous years' consumption. A comparison of how the two options would deliver this model was made including capacity, cost, coverage and reliability. The benefits and risks of each option were then analysed and a Monte Carlo analysis was conducted against 19 variables for each option. WGS was identified as the preferred option for the following reasons:

- known cost with reduced uncertainty
- delivers the capacity required of the NZDF model
- requires more capital expenditure up front but has significantly reduced through life costs
- reliable global access with redundancy built into the system.

How Defence considered interoperability

The SBN project aimed to provide interoperability through common equipment, procedures and support across the NZDF and with the other MoU nations of Belgium, Canada, Denmark, Luxemburg, Netherlands, the United States and also with Australia, which has a separate bilateral MoU with the US. Other types of interoperability (for example of networks, systems and information) are enabled by the increased bandwidth capacity of the network bearer. These systems and services have been or are being provided by other projects such as the Defence Command and Control System (DC2S) and Network Enabled Army (NEA). The global coverage provided by WGS means the Defence Force can be assured of access wherever it deploys.

How Defence considered through-life costs and issues

At the start of this project it was noted that Defence had been operating satellite communications equipment for over 10 years. While there was an existing effort to improve coordination of these activities, the assumption was made in the business case that personnel costs would remain within the Defence baseline, that is, there are no additional personnel requirements linked to this project.

The Defence share of the through-life costs of the WGS satellite are detailed in the WGS MoU. These are an average of US$400k annually for the years 2018 to 2031.

In relation to the infrastructure required to access the WGS satellites, equipment suppliers were asked to provide their recommendations for through life support. The Ministry of Defence and NZDF then agreed on the approach to take. Typically this includes an up-front purchase of spares, warranty, operator and maintainer training and documentation and some form of through-life support agreement.

The detailed business case estimated $460,000 a year for the maintenance and support of the WGS infrastructure. The NZDF have refined these costs as more terminals are delivered, spares consumption is monitored, and terminal repair/overhaul/maintenance cycles are confirmed. However, the early success of the system has attracted more users so the system configuration has continued to change, as well as the cost of operation.

A number of the WGS terminals will not last as long as the satellite constellation does. Estimates for mobile (land-based) terminals range from 5 to 15 years but will be dependant on the frequency of their use and the conditions under which they operate.

To this end a second round of infrastructure acquisition has been included in the years 2022-2025.

Requirements Analysis in the Capability Definition Phase

Options assessed for delivering the SBN capability and operational requirements

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Status Quo	87-144	• Achievable. • No change required. • Cheaper infrastructure. • Flexible.	• All missions continue to be managed in an ad hoc fashion. • All bandwidth has to be purchased and all changes have to be negotiated. • As demand grows so do costs, particularly in congested areas. • Requires a mixture of contracts, equipment and suppliers. • Bandwidth provided to Defence is constrained by the budget available.

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Enhanced Status Quo	71-128	• Achievable. • Centralised SATCOM Management and Control. • Cheaper infrastructure. • Flexible.	• Access to commercial SATCOM can be contended (demand is greater than supply and access becomes limited or very expensive). • Coverage may not be available (either there is no satellite in sight, or all available bandwidth has been sold). • May not meet future demand without further investment.
WGS MoU	112-114	• Achievable with known costs. • Capacity to meet future demand is included. • Guaranteed access. • Reliable, certified equipment. • Global access.	• High up-front capital costs. • Committed to a single supplier. • More expensive infrastructure.
Hosted Payload (NZDF buys a portion of a satellite's capacity)	200+	• High capacity. • Dedicated.	• Global coverage is not provided by one hosted payload (would need a payload on four satellites). • Unaffordable.
Non-satellite option	Less than WGS	• Less equipment to manage. • Not reliant on satellites.	• Does not meet bandwidth requirements and would not enable other defence projects.
Modified WGS MoU	More than WGS	• Greater customisation for NZDF.	• Due to the multinational nature of the MOU it was not able to be renegotiated.
ASSESSMENT	The WGS MoU option was recommended.		

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:

The key capability requirements:

- Provide a computer network infrastructure with global reach, high capacity and robust design.
- Enable the Command and Control of deployed forces.
- Meet the growing demands for information exchange with our deployed forces.
- Provide greater levels of interoperability with the NZDF single services and with our security partners.
- Provide value for money from investment in SATCOM.

Operational Requirements necessary to support the capability included:

The operational requirements cover both the capability of the WGS Satellite and those of the user terminals required to access the Satellite.

- The primary focus for SBN will be the South Pacific but the required support area is global.
- SBN will facilitate the transfer of information and data:
  - to support deployed forces
  - to conduct network enabled operations (all deployed forces on the network)
  - to support Command and Control of the deployed forces (primarily through systems such as DC2S).
- SBN will provide connectivity into the deployed maritime and land environments by providing these units with SATCOM terminals.
- SBN must operate within New Zealand and international radio frequency regulations governed by the International Telecommunications Union.
- SBN will need to support a minimum of three networks on the strategic bearer (an intelligence network, the defence network, and the internet).
- SBN must provide the data throughput requirements for maritime and land units as provided in the NZDF Strategic Communications Operational Requirements Document.
- SBN deployed terminals must be capable of meeting a minimum E1 (2.048 Mbps) data throughput for each user.
- NZDF will establish the Satellite Communications Management Cell within the NZDF Network Operations Centre.
- SBN will support up to six deployed maritime and six deployed land units simultaneously.

NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into functional and performance specifications that became the Statement of Work and contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations.

Schedule of Capability Definition Phase

Dates	Duration	Note
15 November 2010 to 19 March 2012	16 Months	This project was funded from depreciation and the full budget allocated to Vote Defence Force in November 2011. In December 2011 the NZDF signed the MoU with the US DoD officially making WGS the solution for SBN. In March 2012 the NZDF passed responsibility for the acquisition of terminals to the Ministry of Defence while retaining the budget required to implement the MoU. The Ministry was appropriated the first part of the project budget on 25 July 2012.

Expenditure of Capability Definition/ Source Selection Phase

	Expenditure (NZ$million)
Definition phase	0.57
Explanation	During the definition phase, the above costs were classified as pre-acquisition costs and met from the NZDF's operating budget. These were used primarily to provide professional assistance for the IBC and DBC development.

History of Cost Estimates in the Capability Definition Phase

Date	July 2011	September 2011	November 2011	2012
Costs (NZ$ million)	75 – 115	114	90.2	88.9
Explanation of variance	The first two estimates included both SATCOM and High Frequency replacement projects. The first estimate was from the Strategic Assessment and Investment Logic Mapping. The second estimate was from the Indicative Business Case. The third estimate was from the Detailed Business Case. The fourth figure is the approved project budget from Cabinet including $5.6 million of contingency.			

Estimates of Acceptance Date Made in the Capability Definition Phase

Estimates	Initial	At Contract Signing	30 June 2018 Forecast/Actual
Early Access commenced	June 2013	August 2013	August 2013 (Actual)
Initial Operating Capability	June 2014	Not determined[7]	September 2014 (Actual)

[7] As noted in the 2013 edition of the *Major Projects Report*, until a tender was released for the maritime terminals delivery and installation, the timeframes for this component of the project was unknown. It was noted that this may affect completion dates for IOC and FOC.

Estimates	Initial	At Contract Signing	30 June 2018 Forecast/Actual
Full Operating Capability	June 2015	Not determined	February 2021 (Forecast)
Explanation of variance	Delivery and customisation of documentation took slightly longer than originally estimated with IOC declared in September 2014. Additional funding was sought in 2015 to cover the higher-than-expected cost of the maritime terminals and a second Anchor Station. This was approved in 2016 and the total budget now stands at $100.6 million. At the time the additional appropriation was sought, no formal request was made for an increase to the project timeline, although it was known that the additional scope would push out delivery dates. Full Operating Capability is dependent on maritime terminals being installed and operational. Current estimates have the Anzac Frigate terminal installation being scheduled once the Frigate Systems Upgrade had commenced in May 2018, to align with the Frigates' availability.		

ACQUISITION PHASE

Description of acquisition work

There are two parts to the Strategic Bearer Network acquisition. The first is the share allocated to the NZDF for the build and launch of WGS Satellite Nine. These costs are detailed in the MoU with the US DoD, are fixed and are managed by the NZDF. The second part is the acquisition of the infrastructure to enable the NZDF to access the WGS satellites. This includes the acquisition of mobile (land based) terminals, maritime terminals and fixed anchor stations. This part is managed by the Ministry of Defence.

It was agreed with the NZDF to split the first acquisition of WGS infrastructure across three financial years, with an iterative approach to delivering the capability. These three stages were:

- Early Access (EA) in the 2012/13 financial year. Early Access delivered a limited number of mobile terminals and a means of operating a temporary anchor station so that the NZDF was able to start using the WGS constellation to establish communications links. This will allow the NZDF to develop tactics, techniques and procedures, identify logistics requirements, integrate the equipment into Defence networks and familiarise itself with the new technology. Options were included for maritime terminals and fixed anchor stations. This met approximately 10% of the project's total deliverables.
- Initial Operating Capability (IOC) in the 2013/14 financial year. This delivered the first fixed anchor station, maritime terminals and additional mobile terminals. This built on the lessons learned in Early Access, and met approximately 40% of the project's total deliverables.
- Full Operational Capability (FOC) in the 2014/15 financial year. The aim was to deliver the remaining anchor stations and terminals to the users in the NZDF, meeting approximately 80% of the project's total deliverables.

The project has delivered the remaining land mobile terminals and negotiated a Foreign Military Sale order for the maritime terminals with the US Government. The second anchor station will be installed shortly inside RNZAF Base Auckland (Whenuapai).

A number of documents were used to develop the requirements for Early Access, including:

- The NZDF Strategic Communications Operational Concepts Document
- The NZDF Strategic Communications Operational Requirements Document

- The Memorandum of Understanding concerning the joint production, operations and support of Wideband Global Satellite Communications
- The Introduction Into Service Plan for the strategic bearer network.

How Defence decided to acquire the Capability Solution

The strategic bearer network acquisition project team commenced a tender process in November 2012 for Early Access. Twelve responses were received and, from the nine compliant tenders, two successful tenderers were chosen to enter into contract negotiations. These were GigaSat Asia Pacific for the supply of mobile terminals and Rockwell Collins Australia for the supply of a fixed anchor station.

The tender included a detailed section on the tenderers' background, relevant experience, and proven track record of the proposed solution. The response to this was included in the tender evaluation and the ability to provide proven equipment was a mandatory requirement. In addition all equipment has to be certified by the US Government to access the WGS satellites. This provides a level of interoperability built into the system.

The option for the maritime terminals was not taken up as the operational and commercial tender evaluation criteria were not met. The option for the fixed anchor station was taken up as this allowed a head start into the delivery of Initial Operating Capability.

Contracts were signed with GigaSat Asia Pacific on 1 May 2013 and with Rockwell Collins Australia on 26 June 2013. Deliveries commenced in August 2013 and the first connection through the WGS satellite was scheduled for the last week in August.

Maritime terminals were the subject of a dedicated tender which was developed in September 2013 and released to industry in early October 2013. Despite an extended tender process in 2014 there were no successful tenderers for the maritime terminals. The Ministry of Defence then engaged with the US Government to purchase the terminals directly through the Foreign Military Sale, signing a contract in August 2016.

Contractor for Mobile Terminals	GigaSat Asia Pacific, operating out of Canberra.
Contractor for Anchor Stations	Rockwell Collins Australia, operating out of Sydney.
Provider of Maritime Terminals	US Government through Foreign Military Sale.

SBN PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	100.6
Life to date expenditure	88.6
Total forecast expenditure	100.7
Gross project variation (forecast)	(0.1)
Foreign exchange impact	2.9
Actual project variation (forecast)	2.8

Budget variation

	Date approved	Total (NZ$ million)
Original budget at Approval to Commit (Note 1 and 2)	14 November 2011	88.9
Transfer from other projects (Note 3)	11 July 2016	11.7
Total approved budget		100.6

NOTE 1. The approved budget is comprised of $51.0 million for NZDF to manage the MoU, $32.3 million for acquisitions made by the Ministry of Defence, and a contingency fund of NZ$5.6 million.

NOTE 2. Within the Ministry of Defence $32.3 million appropriation, $26.3 million of its acquisition budget is currently appropriated. The remaining $6 million is intended to replace obsolete equipment at the mid-point of the MoU, as the Satellite has a longer life than the user terminals, in particular the mobile terminals. The MoU will provide the NZDF with 20+ years' access to the constellation but most mobile terminals will reach their end of life after approximately 10 years.

NOTE 3. In July 2016, Cabinet approved the transfer of $11.7 million of funding from various projects in the Defence portfolio that have delivered under budget. It was also agreed that the contingency funding held for the Strategic Bearer Network project of $5.6 million can be used for acquisition of equipment and infrastructure.

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure (cumulative)	88.6
Remaining balance of approved budget	12.1
Forecast commitments NZDF	6.0
Forecast commitments MoD	6.1

Total forecast expenditure

	Total (NZ$ million)
Approved budget	100.6
Total forecast expenditure	100.7
Gross project variation (forecast)	(0.1)
Foreign exchange impact	2.9
Actual project variation (forecast)	2.8
Variance explanation	Foreign exchange impact.

Project Contingency as at 30 June 2018

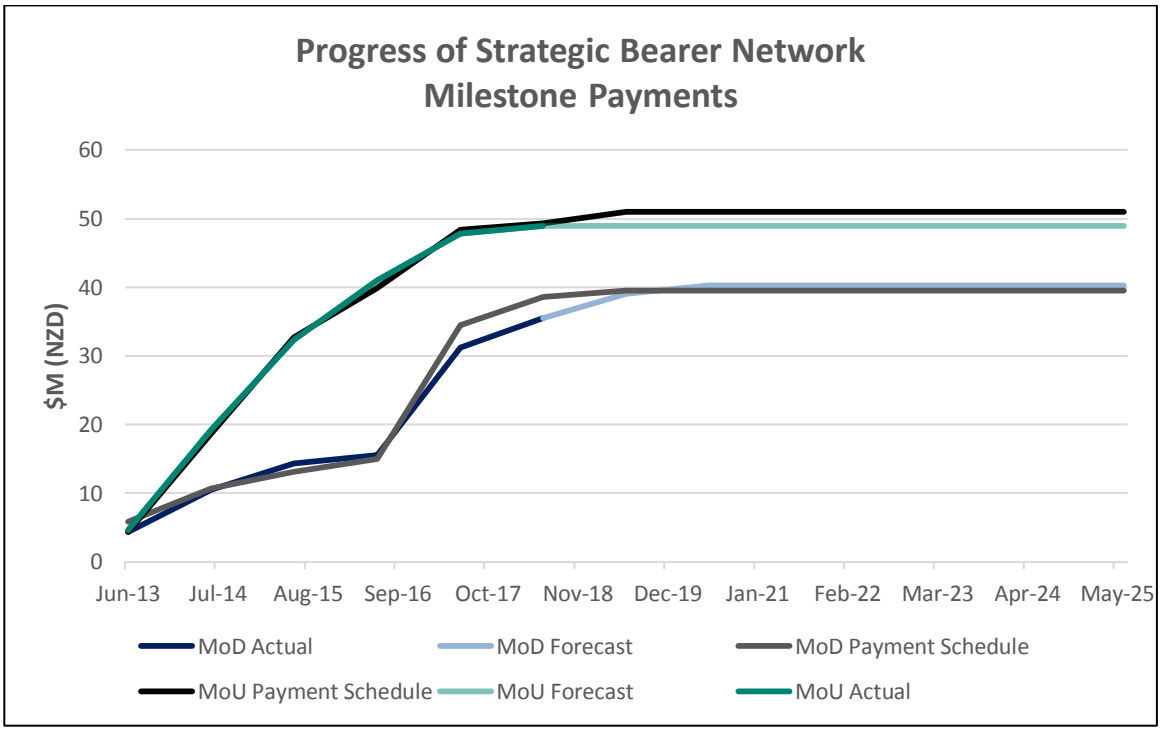
	Total (NZ$ million)
Contingency built into the budget	5.6
Total contingency expended	3.2
Additional funding (see note 3 above)	0.0
Remaining balance	2.4

Explanation of major contingency draw downs

Draw down	Total (NZ$ m)	Explanation
11 July 2016	5.60	[CAB-16-MIN-0354] allows for the use of the $5.6 million in the original Cabinet approval to be used for the acquisition of equipment and infrastructure.
11 July 2016	2.00	Following [CAB-16-MIN-0354], $2 million was utilised within the immediate budget reforecast, leaving $3.6 million to be requested separately when needed.
20 November 2017	0.74	In order to engage the Anchor Station Infrastructure main contractor
15 April 2018	0.48	Additional installation cost of Offshore Patrol Vessel maritime terminals
Total remaining contingency	2.4	

Progress of Strategic Bearer Network Milestone Payments

NOTE: This graph displays the project's progress by comparing actual milestone payments against the milestone payments schedule agreed to in the MoU and acquisition contracts. Milestone payments are made upon the contractor's provision of key deliverables and are therefore a good way to identify timing and size of schedule slippage.



SCHEDULE/TIMEFRAME PROGRESS

The following dates are those in the MoU and those for contract acceptance of acquisitions.

		Initial	30 June 2018 Forecast/Actual	Variation in acquisition phase (months)
Acceptance Date	WGS Satellite Nine	2018	March 2017 (actual)	Nil
	Early Access	30 June 2013	20 August 2013 (actual)	2
	Initial Operating Capability	30 June 2014	30 September 2014 (actual)	3
	Final Operating Capability	30 June 2015	February 2021 (Forecast)	68

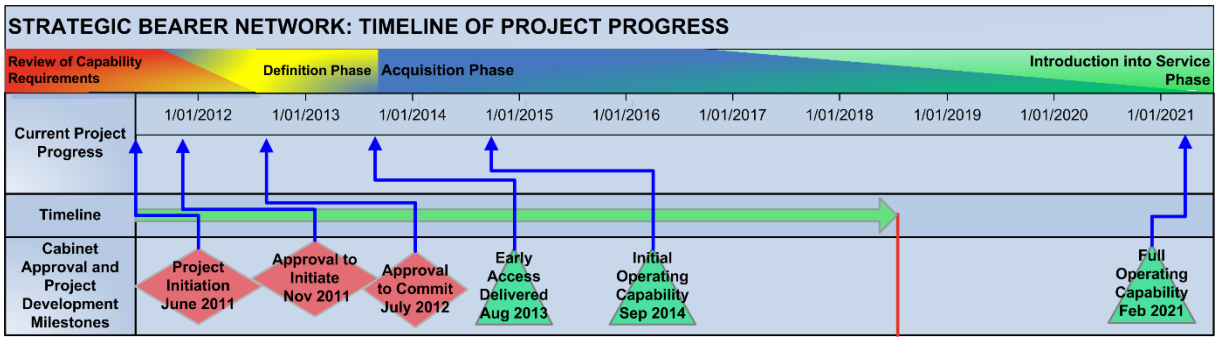
History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
20 August 2013	2	Early Access: there was a delay in producing the supporting documentation.
30 September 2014	3	Initial Operating Capability: there was a delay in producing the supporting documentation and processes to operate and maintain the mobile terminals.
February 2021	18	Full Operating Capability: Delivery times for the maritime terminals are longer than expected. This long lead time combined with fitting into the Navy ship installation schedule delayed the project by over 12 months. There have also been delays in the identification of a location for the second anchor station.
	12	Arrangements to complete the acquisition of the maritime terminals and second anchor station has added 12 months to the schedule.
	38	The Anzac Frigate terminals are dependent on the Frigate availability and existing upgrade plan managed by the Frigate System Upgrade (FSU) project.

SBN PROJECT STATUS AS AT 30 JUNE 2018

Capability: The Practical Completion of the Infrastructure Main Contract for the second Anchor Station based in Whenuapai was formally achieved on 20 July 2018. Interim Operational Release (IOR) for the Offshore Patrol Vessels (OPV) maritime terminals is being sought in the Transition Working Group meeting on 13 July 2018.

	Schedule: Both the Whenuapai Anchor Station and the Maritime Terminal installations are behind the baseline schedule. Updated schedules for the Anchor Station and Maritime Terminal Installations have been included in an updated SBN Project Charter which is being circulated for endorsement and approval.
	Cost: The project was required to access available contingency, but is not forecasting to exceed the current approved allocation. Access to contingency was approved for the second anchor station and the first three maritime terminals.



DEVELOPMENTS POST 30 JUNE 2018

The decision was made not to submit the updated Project Charter for approval at the Defence Capability Governance Board. Instead, the intention is to re-baseline the schedule within the Interim Operational Capability documentation.

The second Anchor Station installation has been accepted and the Offshore Patrol Vessels' Maritime terminals have all achieved Interim Operational Release. The project is working to towards closure and is seeking to transfer scope and related costs for the two remaining maritime terminals, which will be installed on the Anzac frigates, to the Frigate Systems Upgrade project.

INTRODUCTION INTO SERVICE

Description of Introduction into Service phase

Seven small mobile land terminals were contractually accepted by the Ministry of Defence and delivered to the NZDF for completion of introduction into service activities.

Contract acceptance involved the following activities and deliverables:

- inspection and inventory of the equipment
- Installation, Set to Work, and Acceptance Tests (ISAT) of the equipment including integration with defence networks
- operations and maintenance training and manuals
- technical documentation, software applications and drawings
- spares
- recommended Through Life Support Plans (TLSP)
- warranties.

Since delivery, the NZDF (units from the NZ Army and RNZAF) has undertaken the following introduction into service activities:

- Initial Operational Test and Evaluation (IOT&E)
- deployment of mobile equipment on operations and exercises
- development of Standard Operating Procedures (SOPs) for the use of the equipment

- codification/entry of equipment into asset and engineering management
- evaluation of training, documentation and Through Life Support Plan (TLSP) for suitability
- evaluation of equipment operation for reliability, availability and maintainability
- development of ILS documentation, integration of training documentation and maintenance SOPs.

The equipment has performed to specification and exceeded it in most scenarios. It has also been successfully integrated into the Defence networks. There has been a delay in declaring interim operating capability as some peripheral equipment was not part of the main order.

Status of the Introduction into Service Plan

Separate Introduction into Service plans were developed for each family of terminals; large mobile land and small terminals. The plans for maritime terminals have been developed as they are delivered and we move towards Full Operating Capability (FOC).

The NZDF Satellite Network Operations Centre (SATNOC) has been established and manages all NZDF WGS communications and the MOU with the US Department of Defence.

SCHEDULE OF INTRODUCTION INTO SERVICE

	Initial Estimate	30 June 2018 Forecast/Actual	Variance (months)
Early Access accepted by Crown	30 June 2013	20 August 2013 (Actual)	2
Interim Operational Release (IOC)	30 June 2014	30 September 2014 (Actual)	3
Full Operational Capability (FOC)	30 June 2015	February 2021 (Forecast)	68
Explanation	FOC accepted by the Crown is when the entire infrastructure has been acquired and delivered to the NZDF. There is a longer lead time in the tender evaluation, contract negotiation, delivery and installation of the maritime terminals than originally forecast and this has led to the slip in FOC by 68 months. The dates for FOC Introduction into Service by the NZDF were significantly later than the delivery of the Ministry of Defence-led acquisition as the full capabilities of the Wideband Global Satellite constellation were not available until all nine satellites had been launched.		

SBN OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements as at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

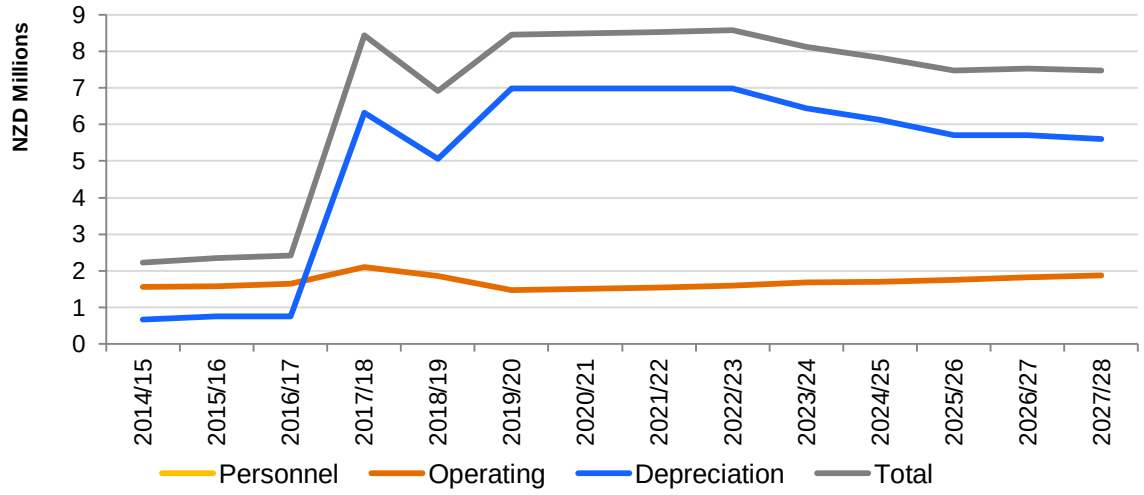
Operational Requirements	Requirement likely to be met	Comment

Operational Requirements	Requirement likely to be met	Comment
The primary focus for SBN will be the South Pacific but the required support area is global.	Yes	The nine WGS satellites launched provide global coverage.
SBN will facilitate the transfer of information and data: • to support deployed forces; • to conduct network enabled operations (all deployed forces on the network); and • to support Command and Control of the deployed forces (primarily through systems such as DC2S).	Yes	WGS has already been used to support NZDF operations and exercises in New Zealand, the South Pacific and further afield. NZDF networks have been implemented over the WGS bearer and testing will continue as DC2S is rolled out to the deployed forces.
SBN will provide connectivity into the deployed maritime and land environments by providing these units with SATCOM terminals.	Yes	Mobile terminals have been used to support both NZ Army, RNZAF and Joint operations. Two of the three OPV terminals have been installed.
SBN must operate within NZ and international radio frequency regulations governed by the International Telecommunications Union.	Yes	Radio licenses have been issued for use of mobile and fixed WGS terminals though further work is required for the operation of maritime terminals.
SBN will need to support a minimum of three networks on the strategic bearer (an intelligence network, the defence network, and welfare).	Yes	The Defence networks have been proven to work over WGS.
SBN must provide the data throughput requirements for maritime and land units as provided in the NZDF Strategic Communications Operational Requirements Document.	Yes	Mobile and fixed terminals have met the specifications required of the ORD. Two of the three OPV terminals have been tested.

Operational Requirements	Requirement likely to be met	Comment
SBN deployed terminals must be capable of meeting a minimum E1 (2.048Mbps) data throughput for each user.	Yes	All terminals delivered to date exceed the specifications required. Maritime terminals are yet to be tested.
The NZDF will establish the Satellite Communications Management Cell within the NZDF Network Operations Centre.	Yes	The NZDF has established the Satellite Network Operations Centre (SATNOC) in the Freyberg Building.
SBN will support up to six deployed maritime and six deployed land units simultaneously.	Yes	The current anchor station can support sixteen deployed units. Maritime deployments are yet to be tested.
Benefits realisation is scheduled for full implementation by 2020.		

Summary of SBN Through Life Operating Cost Estimates

Strategic Bearer Network Phase 1: Through Life Operating Costs



MARITIME SUSTAINMENT CAPABILITY

Project Description: The Maritime Sustainment Capability (MSC) will replace the Navy's existing replenishment tanker HMNZS *Endeavour*. The replacement vessel will provide an enhanced capability which is better able to support land operations and is polar code compliant, allowing the ship to operate to Antarctica in the summer season.

THE PURPOSE OF THIS PROJECT

HMNZS *Endeavour* played a key supporting role in the delivery of the Defence Force's principal roles, as discussed in the Defence White Paper 2016. *Endeavour's* role has been particularly significant due to New Zealand's unique geostrategic environment. No other country of comparable size and political and economic standing has at a minimum to be able to deploy equipment and personnel from the Equator to Antarctica. The naval tanker has extended the endurance and range of the Defence Force's naval vessels, significantly increasing the utility of the Defence Force's naval combat capability.

The Maritime Sustainment Capability will maintain the Government's options to contribute to operations outside New Zealand's immediate region by providing a continued ability to sustain Defence Force and coalition platforms deployed further afield. The overarching benefits of the Maritime Sustainment Capability are:

- Provision of an independent and complementary Maritime Sustainment Capability to New Zealand and its security partners.
- An improved ability to shape and react to events in New Zealand, Australia and the South Pacific.
- The provision to government of a greater flexibility in response options to threats and emergencies.
- The provision to government of support to New Zealand's civilian presence in Antarctica.

Capability Requirements

- Conduct maritime force logistic support
- Maintain deployable bulk fuel reserves
- Provide an effective and appropriate maritime platform
- Provide support to other government agencies with specific fitted capabilities.

MSC's Government Approval Milestones[8]

Date	Approved By	Approval
26 Jan 2011	Deputy Secretary (Policy), Ministry of Defence & Vice Chief of Defence Force	**Approval of Original Project Charter**
23 October 2012	CAB (12) 37/4	**Approval of Indicative Business Case** Cabinet invited the Minister of Defence to progress to a Detailed Business Case, which would present Cabinet with a short-list of options.
30 June 2014	CAB Min (14) 22/9	**Approval of Detailed Business Case** Cabinet agreed that a medium-level capability option be taken forward for detailed design as part of a Project Implementation Business Case
4 July 2016	CAB-16-MIN-0313	**Approval of Project Implementation Business Case** Agreed that the replacement Maritime Sustainment Capability include winterisation and ice-strengthening, and authorised the Secretary of Defence to conclude contracts. This confirmed the decision of the Cabinet Economic Growth and Infrastructure Committee on 29 June 2016 [EGI-16-MIN-0141].

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

Originally called the Maritime Projection and Sustainment Capability (MPSC) project, preparatory work lasting several years led to the issue of a Project Charter in 2011. Under this, the project would seek to procure and introduce into service a Maritime Sustainment Capability that satisfies user requirements, replacing the Defence Force's current naval tanker HMNZS *Endeavour*.

Introduced into service in 1988, *Endeavour* had an expected service life of 20 years. Non-compliance with international maritime regulations and obsolescence of critical ship systems means that *Endeavour* would need to retire from service in 2018. Without a replacement capability the retirement of *Endeavour* would result in the Defence Force being unable to

[8] These are generic titles for Cabinet approval points in the capability definition process. Whilst the actual titles of Cabinet Papers have varied, the approvals and direction they were seeking from Cabinet has been broadly consistent with the definitions provided.

conduct maritime sustainment, and support maritime projection for both its own operations and those conducted with partners.

The 2010 Defence White Paper signalled that a capability to replace *Endeavour* would be acquired. It also signalled the possibility that the replacement vessel would incorporate some sealift capability to supplement HMNZS *Canterbury*, the Defence Force's multirole vessel.

An Indicative Business Case was approved by Cabinet in October 2012. This paper outlined two broad options for the project; a like-for-like replacement of *Endeavour*, or a replacement which would provide both sustainment and sealift capabilities.

A Detailed Business Case was approved by Cabinet in June 2014, eliminating the option of including sealift capability to allow funding to be prioritised to other capital projects. If additional sealift was required by the Defence Force this would be met through commercial charter. After this decision the project became the Maritime Sustainment Capability.

The option selected by Cabinet in the Detailed Business Case enhanced the Defence Force's maritime sustainment capability by providing a ship with:

- increased fuel storage over that provided by *Endeavour*
- the ability to transport ammunition
- the ability to operate and support helicopters up to the size of an NH90, and
- the ability to transport aviation fuel allowing it to sustain operations by multiple helicopters.

The estimated capital cost was $452 million.

Cabinet also noted that Defence were in discussion with Antarctica New Zealand on the benefits and costs of winterisation, and that the estimated additional cost of this would be $15 million.

In the Defence White Paper 2016 Ministers took a decision to ice-strengthen and winterise the replacement for *Endeavour* to increase New Zealand's ability to replenish New Zealand and other countries' Antarctic programmes.

Cabinet selected a medium-level Maritime Sustainment Capability, as recommended in the Detailed Business Case, with the addition of winterisation and ice strengthening. The estimated capital cost $493 million, including $64 million for winterisation of the vessel.

How Defence analysed the requirements options in the Capability Definition phase

Options available for the replacement of *Endeavour* were assessed against the key benefits identified during the business case process.

Each of the options available for the replacement of *Endeavour* was assessed against its ability to deliver these benefits.

The cost of each option, indicated through a Request for Information and other unsolicited proposals, was then compared with the deliverable benefits.

This led to the selection of the replacement option that offered the greatest level of benefits for the Defence Force within the available funding.

How Defence considered interoperability

Interoperability was considered a key attribute for the MSC project. *Endeavour* made an important contribution to the defence alliance with Australia as one of only three replenishment tankers in the combined fleets. Just under 40% of fuel delivered by *Endeavour* had been provided to Australian ships.

The replacement capability has a requirement to operate seamlessly with Australian assets and those of other security partners. As such the capability was required to have NATO compliant replenishment at sea capacities, and to transport NATO standard fuels.

How Defence considered through-life costs and issues

The Maritime Sustainment Capability through-life costs have been based on the historical average operating costs of *Canterbury* and *Endeavour*. These historic costs were applied to the Maritime Sustainment Capability platform expected utilisation of 160 days a year.

Requirements Analysis in the Capability Definition Phase

Options assessed for delivering the Maritime Sustainment Capability and operational requirements

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Option 1: 'Renew' naval tanker	$358-$418	Delivers the same level of capability as *Endeavour* provided when it entered into service in 1988. It would be a new commercial naval tanker, optimised for military operations, able to replenish multiple naval vessels and, to a lesser extent, deployed land forces. Additional sealift would be provided by commercial charter if needed.	Does not provide for the expected fuel needs associated with deploying a full scale, amphibious-capable Joint Task Force. It has a limited aviation capability, reduced number of supply classes and lack of ability to support the use of landing craft.
Option 2: 'Renew' off-the-shelf tanker	$355-$410	Delivers a new commercial naval tanker with selected features designed for Norwegian military. It is not optimised for the New Zealand Defence Force and comes with limited equipment and system installation (in order to reduce its capital cost), although these systems could be fitted at a later date if required. Additional sealift would be provided by commercial charter if needed.	Provides a lower level of capability than Option 1. Should the strategic environment change, this option has the advantage of providing Government with an ability to increase the ship's capability in the future because of its 'fitted for but not with' design. The cost of retrofitting later, however, would be significantly more than if the systems were included during the initial build.

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Option 3: 'Enhanced' naval tanker	$389-$452	Delivers a commercial naval tanker with selected military features. It would effectively upgrade the New Zealand Defence Force's maritime, land and air replenishment capability to be able to support a large-scale, amphibious-capable Joint Task Force. In addition to the capabilities offered by Options 1 and 2, it could transport ammunition, operate and support a helicopter up to the size of an NH90, and store a comparatively larger amount of fuel, including sufficient aviation fuel to sustain the deployment of multiple helicopters. Additional sealift would be provided by commercial charter if needed.	It could not support amphibious sealift operations and would not have the ability to operate in Antarctic waters.
Option 4: 'Enhanced' naval tanker with organic, amphibious sealift	$429-$495	Builds on the capability of option 3, adding design features that allow the ship to act as an organic, amphibious sealift and Humanitarian Assistance and Disaster Relief response vessel. This includes 260 lane metres for vehicle or container transport, faster vessel speed, a role 2 medical facility, two Landing Craft Medium (LCM) to enable amphibious lodgement of equipment and personnel, and a deck crane to enable lifting and stowage of two LCMs. This option would supplement *Canterbury's* sealift capabilities and capacities, providing an alternative deployment option to *Canterbury* if it was unavailable.	It would not have the ability to operate in Antarctic waters. Higher capital cost than other options.

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Option 5: Additional bolt on option (Antarctic support option)	Additional $64 million for ice features – Total of $493 million	The addition of winterisation and ice strengthening features to Options 1, 3 and 4 would increase the versatility of the vessel to support operations in Antarctic waters, including resupply of New Zealand and American bases.	Highest capital cost out of all the options. Would present a potential opportunity cost as employment of the ship in this way would need to be balanced against other tasks, such as support to other New Zealand Defence Force vessels or responding to a Humanitarian Assistance and Disaster Relief event.

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:

The roles of the Maritime Sustainment Capability (MSC) are derived from the Operational Concept Document with the exception of Operational Need 4, which is derived from the requirements for support to Antarctica New Zealand. The roles are categorised as:

- **Operational Need 1** - Conduct maritime force logistic support.
- **Operational Need 2** - Maintain deployable bulk fuel reserves.
- **Operational Need 3** - Provide an effective and appropriate maritime platform.
- **Operational Need 4** - Support to other government agencies with specific fitted capabilities.

MSC Vessel Roles

- The primary roles of the MSC are:
  - Replenishment of naval ships.
  - Sustainment of land/air forces.
  - Maintain naval fuel reserves.
  - Sustainment of New Zealand Antarctic base
- The secondary roles of the MSC vessel are:
  - Assistance to civil authorities.
  - Aviation training.
  - Collection of environmental data.
  - Defence diplomacy.
  - Defence training exercises and activities.
  - Generic at sea Core Mariner training.
  - Humanitarian Assistance and Disaster Relief (HADR).
  - Maritime disaster pollution control assistance.
  - Multi-Agency Operations and Tasks.
  - Search and Rescue.
  - Surveillance.
- Logistic support primarily exists to ensure that combat forces can meet readiness levels and be deployed, sustained and re-deployed to meet the operational aims of Command. Logistic support includes provision of the stores and spare parts required by units, the supply and resupply of fuel and lubricants, ammunition and food, and provision of medical support, maintenance support, personnel support and hotel services.
- An Auxiliary Oiler Replenishment Helicopter (AORH) platform of the New Zealand Defence Force enables all Royal New Zealand Navy platforms to have greater endurance and to remain ‘on station’ longer by the provision of fuels, stores, rations and ammunition.

The endurance of both the Anzac frigates and the Offshore Patrol Vessels are limited both by the space available to carry food (maximum of 28 days) as well as their fuel capacities. While both vessels have relatively long endurance the support of an AORH allows Command greater operational flexibility when employing these vessels.

Operational Requirements necessary to support the capability include:

The key operational requirements are:

- Conduct Maritime Force Logistic Support/Maintain Deployable Bulk Fuel Reserves.
    - Replenishment at Sea (RAS), including light jackstay, and RAS(L) systems.
    - Organic Aviation systems, including Vertical Replenishment (VERTREP), Helicopter In-flight Refuelling (HIFR) and maintenance support systems for organic helicopter.
    - Stowage and distributions systems for bulk supply Classes:
        - 1 (food and water)
        - 2 (general stores)
        - 3 (petroleum, oils, liquids)
        - 5 (ammunition)
        - 9 (repair parts)
- Provide an Effective and Appropriate Maritime Platform.
    - Endurance, speed and range.
    - Navigation and manoeuvring systems.
    - Communications systems.
    - Engineering and logistics management systems.
    - Basic Damage Control systems.
    - Role 1 Medical Facility.
    - Quality of Life systems.
- Provide a Maritime Platform that can integrate effectively with a military force.
    - Self protection systems.
    - Local Intelligence, Surveillance Reconnaissance (ISR) systems.
    - Military communications/network systems.
- Advanced Damage Control systems.
- Provide support to Land Operations
    - Support to Embarked Force systems.
    - Stowage and distributions systems for bulk supply Classes:
        - 1 (food and water)
        - 2 (general stores)
        - 3 (petroleum, oils, liquids)
        - 5 (ammunition)
        - 9 (repair parts)
- Support maintenance systems for non-organic helicopters.

NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations.

Schedule of Capability Definition Phase

Dates	Duration	Note
23 October 2012 to 30 June 2014	**20 Months**	Cabinet Approval of IBC to Cabinet Approval of DBC
1 July 2014 to 29 June 2016	**24 Months**	Cabinet Approval of DBC to Cabinet Approval of PIBC – included Capability and Industry Review Activity

Expenditure of Capability Definition/ Source Selection Phase

	Expenditure (NZ$ million)	
Life of Type Study	Not Applicable	
Definition phase	FY 2012/13	1.00
	FY2013/14	0.33
	FY 2014/15	0.62
	FY 2015/16	0.44
Explanation	Cabinet approved $1.016 million for FY 2014/15 and $1.403 million (including $0.783 million of Capital) for FY 2015/16 (CAB Min (14) 22/9).	

History of Cost Estimates in the Capability Definition Phase

Date	30 June 2014	29 June 2016	Contract Signing
Costs (NZ$ m)	467	493	492
Explanation of variance	The Detailed Business Case estimate of $467 million included a provision of $15 million to upgrade the vessel for Antarctic support. The cost of the Antarctic support option at source selection was $64 million of the $492 million.		

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	At Contract Signing	30 June 2018 Forecast/Actual
Ship Acceptance	May 2020[9]	May 2020	May 2020 (Forecast)

[9] On 4 July 2016 Cabinet confirmed approval of the MSC Project Implementation Business Case, and agreed that the replacement Maritime Sustainment Capability was to include winterisation and ice-strengthening. The MSC project replaced the Maritime Projection and Sustainment Capability project, which did not have an Antarctic Support Option.

ACQUISITION PHASE

Description of acquisition work

In July 2016 Cabinet approved the Implementation Business Case for the Maritime Sustainment Capability, and authorised the Secretary of Defence to commit to contracts and authorise expenditure of public money.

Following this, the Secretary of Defence signed contracts with Hyundai Heavy Industries (HHI) on 25 July 2016. HHI was the preferred supplier of the four shipyards that participated in the tender process and will act as the Prime Contractor for the design, build, acceptance and delivery of the ship. HHI carries full responsibility and risk for any subcontract agreements that it makes with other suppliers.

How Defence decided to acquire the Capability Solution

Tender Process

Following Cabinet approval to proceed to tender as part of the Detailed Business Case, the Ministry of Defence issued a Request for Tender based on detailed technical requirements (specification) for a Maritime Sustainment Capability. Included in the Request for Tender was a costed option for support to Antarctica.

Tender responses were received from four shipyards. A fifth company provided an un-costed proposal. The responses were assessed in accordance with the Maritime Sustainment Capability Tender Evaluation Plan, and following this two companies were down-selected for further evaluation.

Risk reduction and clarification activities

Risk reduction and clarification activities were undertaken in September 2015, which complemented the best and final offer process. The risk reduction activities provided the Project with:

a. confidence that both Shipyards could deliver a credible solution;
b. clarification of the achievability of the Maritime Sustainment Capability requirements; and
c. an opportunity to ask questions regarding the Project Team's observations of their Tender response.

Following risk reduction activities, a tailored request for Best and Final Offer was submitted to the two down-selected companies.

Best and final offer process

The best and final offer process addressed the following issues with the two down-selected companies, prior to selection of the preferred proposal:

a. addressed clarification questions that had been generated from the Tender evaluation activities;
b. committed to equipment selection for key systems, aligned with the Project's Makers List or agreed alternatives; and
c. provided a firm Antarctic support option, with an amended cost structure, project schedule and technical specification.

The evaluation of the best and final offers identified Hyundai Heavy Industries as the preferred Tenderer to provide an enhanced naval tanker and an Antarctic support option.

Due diligence

Due diligence was undertaken with Hyundai Heavy Industries at their shipyard in Ulsan, South Korea. The due diligence activity provided further opportunity to clarify the vessel requirements, view key shipbuilder's internal processes and systems, and support the selection of cost saving options in preparation for contract negotiations.

Contractual arrangements

At contract negotiations, the Crown and Hyundai Heavy Industries negotiated an agreed Contractor's Technical Specification, logistic support including Life Cycle Costing Analysis, an acceptance regime and preliminary selection of major items of equipment (significantly lowering the risk to both the Contractor and the Crown). This strategy supported the aligning of both parties' expectations as well as minimising contingency components built into the negotiated price. The accurate and comprehensive project costs and data were then incorporated in the Implementation Business Case.

Separate tenders and contracts will be established with suppliers of services or systems; examples of this will be the shipyard superintendence services and the supply of government furnished equipment. The Project Team will be responsible for the facilitation and management of these contracts.

Prime Contractor for enhanced naval tanker and Antarctic support option	Hyundai Heavy Industries

MSC PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	492.9
Life to date expenditure	212.7
Total forecast expenditure	498.9
Gross project variation (forecast)	(6.0)
Foreign exchange impact	6.4
Actual project variation (forecast)	0.4

Budget variation

	Date approved	Total (NZ$ million)
Pre-contract capital	30 June 2014	0.8
Original budget at approval to commit	29 June 2016	492.1
Current approved budget		492.9

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure (cumulative)	212.7
Remaining balance of approved budget	280.2
Forecast commitments	286.3

Total forecast expenditure

	Total (NZ$ million)
Approved budget	492.9
Total forecast expenditure	498.9
Gross project variation (forecast)	(6.0)
Foreign exchange impact	6.4
Actual project variation (forecast)	0.4
Variance explanation	Due to Foreign exchange impacts the actual project variation is a lot lower than the gross project variation.

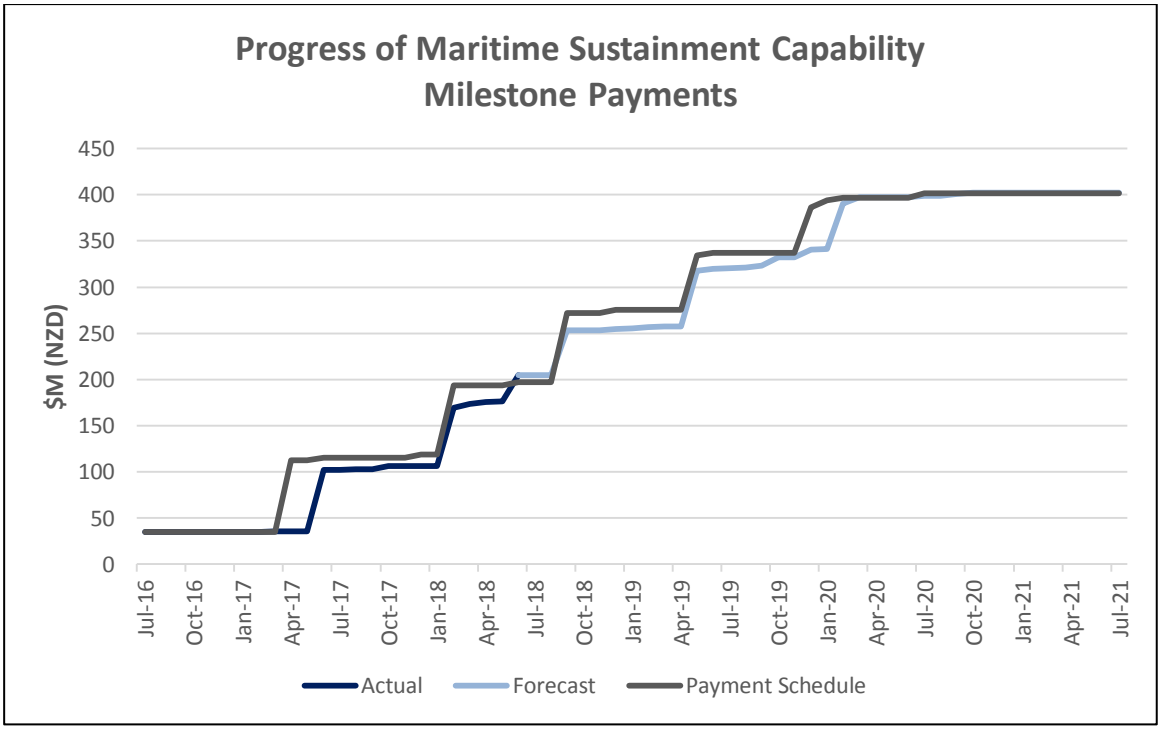
Project Contingency as at 30 June 2018

	Total (NZ$ million)
Contingency built into the budget	45.0
Total contingency expended	8.0
Remaining balance	37.0

Explanation of major contingency draw downs

Draw down	Total (NZ$ m)	Explanation
5 March 2018	8.0	Approved by the Secretary of Defence to fund: • Upgraded contracted paint specification to meet the amended Naval Coating Standard in accordance with the Technical Airworthiness requirements for carriage of aviation fuels. • Costs associated with the introduction of an Integrated Project Team (IPT) for the project. • Extension of the posting duration of the IPT Design Manager until the end of the spatial design review and on site administrative support to end of build period.
Total remaining contingency	**37.0**	

Progress of Maritime Sustainment Capability Milestone Payments



SCHEDULE/TIMEFRAME PROGRESS

The following dates are those in the Memorandum of Understanding and those for contract acceptance of acquisitions.

		Original forecast at Approval to Commit	30 June 2018 Forecast/Actual	Variation in acquisition phase (months)
Acceptance Date	Contract Award	July 2016	July 2016 (Actual)	0
	Preliminary Design Review (PDR)	April 2017	October 2017 (Actual)	6
	Detailed Design Review	February 2018	June 2018 (Actual)	4
	Work Commences	February 2018	January 2018 (Actual)	0

History of variations to schedule

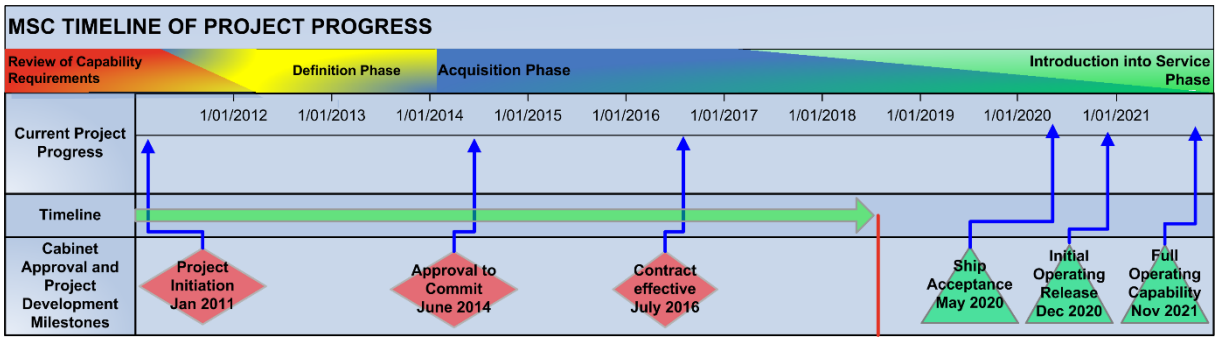
Date of individual variation	Variation length (months)	Explanation
October 2017	6	Preliminary Design Review: The scheduled completion date (April 2017) for the PDR was not met and in May that year the project was forecasting anticipated completion by end June. This was achieved in October 2017. While key elements of the PDR were not completed until October 2017, HHI continued with the detailed design review of main elements in parallel with this process.
June 2018	4	Detailed Design Review completion: although this milestone was achieved four months later than scheduled, it did not impact the commencement of production, which occurred when steel cutting commenced in January 2018. The launch (flooding of the dry dock) has been delayed until April 2019 but the overall schedule remains within baseline. HHI advised that it is quicker to complete a greater level of outfitting before construction blocks are assembled in the dry-dock.

MSC PROJECT STATUS AS AT 30 JUNE 2018

	Capability: Progress is tracking behind the contracted schedule and HHI have implemented a mitigation plan to address this; the impact being a move of the launch date by 21 calendar days. However HHI has advised that the ship acceptance dates in Korea and NZ have not been affected by this change to the project milestone.
	Schedule: HHI completed DDR. This is four months behind the contracted schedule, however it has not impacted the start of production, which occurred when steel cutting commenced on 29 January 2018. The project is within the baseline schedule.
	Cost: It is anticipated that the project will be able to manage costs throughout the life of the project and ensure no overall overspend.

DEVELOPMENTS POST 30 JUNE 2018

Work in the dry dock commenced with completed blocks joined in time for the keel laying. A ceremony to mark this milestone took place in Ulsan on 13 August 2018.



INTRODUCTION INTO SERVICE

Description of Introduction into Service phase

At the time the Project Implementation Business Case was being developed, it was envisaged that the Introduction into Service Stage would run concurrently with some earlier stages of the project and increase in tempo as the emphasis increased on the NZDF being able to receive and safely operate the MSC.

Introduction into Service would be at its peak after Contractor Sea Trials. During these trials the Defence Force tests and measures 'total system performance' against the original User/System Requirements and are then able to advise whether or not the originally envisaged capability has been delivered.

Introduction into Service will be completed when Operational Release has been reached and where the Project Sponsor (Chief of Navy) agrees that the project outcome reflects the User Requirements Document.

Status of the Introduction into Service Plan

The MSC Capability Integration Plan (CIP) is at the consultation phase.

SCHEDULE OF INTRODUCTION INTO SERVICE

	PIBC	30 June 2018 Forecast	Variance (months)
Initial Operational Release	December 2020	June 2020	-6
Operational Release	November 2021	May 2021	-6
Benefits Realisation	January 2022	July 2021	-6

MSC OPERATIONAL CAPABILITY

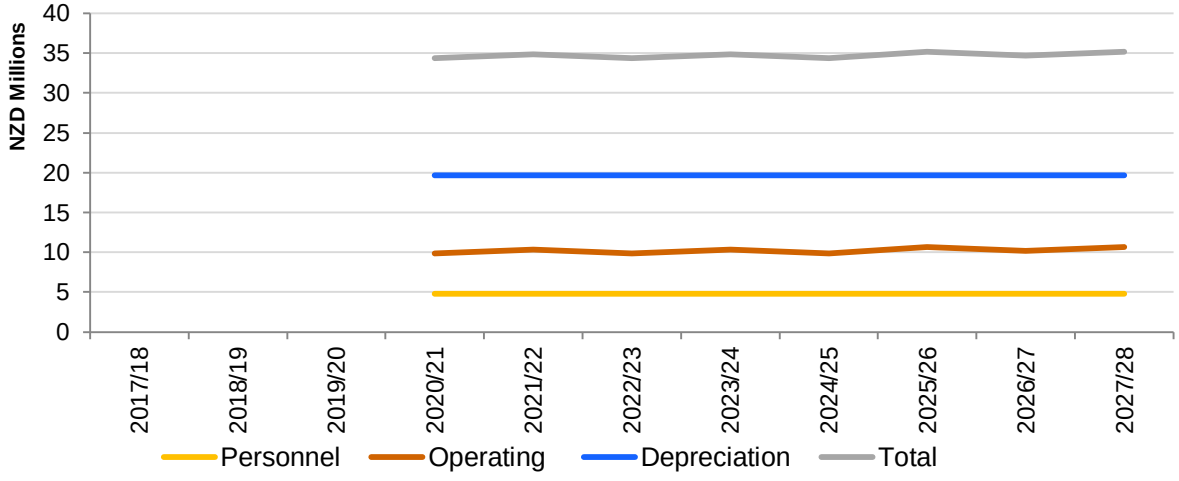
Progress towards Delivery of Operational Requirements as at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

Operational Requirements	Requirement likely to be met	Comment
Conduct Maritime Force Logistic Support/Maintain Deployable Bulk Fuel Reserves Replenishment at Sea (RAS), including light jackstay, and RAS(L) systems. • Organic Aviation systems, including Vertical Replenishment, Helicopter In-flight Refuelling and maintenance support systems for organic helicopter. • Stowage and distributions systems for bulk supply Classes: - 1 (food and water) - 2 (general stores) - 3 (petroleum, oils, liquids) - 5 (ammunition) - 9 (repair parts)	Yes	All operational requirements will be satisfied during Operational Testing and Evaluation between Initial Operational release in June 2020 through to full operational release in May 2021.

Operational Requirements	Requirement likely to be met	Comment
Provide an Effective and Appropriate Maritime Platform. • Endurance, speed and range. • Navigation and manoeuvring systems. • Communications systems. • Conduct maritime force logistic support • Basic Damage Control systems. • Role 1 Medical Facility. • Quality of Life systems.		
Provide a Maritime Platform that can integrate effectively with a military force. • Self protection systems. • Local Intelligence, Surveillance Reconnaissance (ISR) systems. • Military communications/network systems. • Provide organic anti-piracy self defence.		
Provide support to Land Operations: • Operate and be interoperable with other NZDF naval and allied/coalition naval forces and non naval NZDF/non naval allied/coalition forces. • Stowage and distributions systems for bulk supply Classes: - 1 (food and water) - 2 (general stores) - 3 (petroleum, oils, liquids) - 5 (ammunition) - 9 (repair parts)		
Support maintenance systems for non-organic helicopters.		
Benefits realisation is scheduled for full implementation by January 2022.		

Summary of MSC Through Life Operating Cost Estimates



SPECIAL OPERATIONS VEHICLES

Project Description: The Special Operations Vehicles (SOV) project is to provide the NZDF with a fully supported special operations land mobility capability to enable the conduct of New Zealand Special Operations Forces core tasks in delivering directed operational outputs. The project will focus on the enabling of special reconnaissance and direct action operations to meet the challenges of the contemporary operating environment, emerging threats, and future operating concepts.

THE PURPOSE OF THIS PROJECT

The benefits of the project are to ensure that the New Zealand Special Operations Forces can continue to do their job with improved capability, via increased effectiveness (through having vehicles that are better suited to the range of tasks undertaken), increased efficiency (through vehicles that are more fit for purpose) and with reduced risk.

The specific benefits identified are:

- Reduced constraints on directed tasks;
- Reduced risk of avoidable harm to personnel; and
- Improved Special Operations Forces performance.

Capability Requirements

The following vehicle types are best suited to the tasks performed by New Zealand's Special Operations Forces:

- **Mobility Heavy** – provides endurance, mobility, and has ample capacity for personnel, weapons and equipment.
- **Protected Heavy** – provides better protection for direct action and counter-terrorism tasks.
- **Low Profile Protected and Utility** – allow Special Operations Forces to adopt a low profile and undertake less overt operations, whilst retaining some combat capabilities.

SOV Government Approval Milestones[10]

Date	Approved By	Approval
16 Feb 2012	Chief Executives	SOV Charter (Project Initiation) (CAP/6/01101/02-2 LTCP SOV refers)
22 June 2015	Cabinet	SOV Single Stage Business Case (Cab Min (15) 21/3 refers) Approval to negotiate and commit in part

[10] These are generic titles for Cabinet approval points in the capability definition process. Whilst the actual titles of Cabinet Papers have varied, the approvals and direction they were seeking from Cabinet have been broadly consistent with the definitions provided.

11 August 2016	Minister of Defence	Approval to commit (Heavy Mobility/Supacat) (MoD 108/16 refers)

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

The Defence White Paper 2010 confirmed the need for the NZDF to have contemporary combat capabilities. It stressed the need for strategic mobility and interoperability, both within our own forces and with partners. Special Operations Forces have a range of responsibilities in New Zealand (and in those territories that we are responsible for), including support for counter terrorist operations and explosive ordnance disposal. This range of missions, coupled with the requirement for high readiness, necessitates personnel and equipment that are operationally capable at reduced notice.

Vehicles are vital to the Special Operations Forces. Without the tactical mobility that vehicles provide, the range of tasks that can be conducted is reduced. As with the personnel, the vehicles have to be fit for purpose and at a high level of operational preparedness.

The types of missions that Special Operations Forces undertake have expanded over the last two decades, driven particularly by Government expectations and extensive operational experience. This has resolved into four core tasks forming the basis of our Special Operations Forces, as follows:

- Special Reconnaissance: to inform.
- Direct Action: to defeat the adversary.
- Combating Terrorism: to protect.
- Support and Influence: to enable other activities.

All of these core tasks have an equal weighting. New Zealand's Special Operations Forces are required to be at high states of readiness. Lead times for deployment are very short. By their nature, Special Operations Forces are a finite resource. In common with the wider NZDF, the attributes that give them their combat capabilities also suit them well for operations other than combat; for example, providing information and intelligence to allow effective decision making.

Overall, Special Operations Forces capability is a combination of people and equipment, empowered by leadership, doctrine, training and support. All of these aspects must be provided at a very high level to allow them to function effectively in their many roles. Above all, their key attribute is their ability to provide a disproportionate effect in relation to the force size and the effort involved. Vehicles are an important enabler for most operations.

How Defence analysed the options

Given the core tasks explained above, a 'one vehicle fits all' solution is no longer satisfactory. Nor is it satisfactory to rely on the ad-hoc provision of vehicles when a particular operational situation arises. The high readiness and trained state requirements for Special Operations Forces mean that they need to be trained on what they fight with, and have what they need available when they need it.

Conversely, there is a limit to the number of vehicle types a relatively small organisation like New Zealand's Special Operations Forces can realistically afford, maintain and train on. Therefore, vehicles do need to have utility and be adaptable to a wide range of roles.

Broadly, the seven vehicle categories break down into three generic groups, as follows:

Category	A Mobility Heavy	B Mobility Medium	C Protected Heavy	D Protected Medium	E Protected Light	F Low Profile	G Low Profile Utility
Key Design Driver	**Mobility**		**Protection**			**Low Profile**	

Each category was assessed against each of the mission types. It was apparent that no one vehicle perfectly fitted all missions. The Category A vehicle was the most versatile, although it is unmistakeably a military vehicle; is an expensive way of undertaking less demanding tasks; and has some shortfalls if armour protection is important to the specific task.

The C Category vehicle was also quite versatile, and provides the all round protection that the mobility dominant vehicles lack. Its space and capacity to support weapons and electronics make it a better choice than the smaller protected (D and E) vehicles.

The modified civilian vehicles (F and G) scored well in the combating terrorism and support and influence roles. They are less suitable for special reconnaissance and direct action. Vehicles of these types are considerably cheaper to acquire and operate than specialised military vehicles.

The two types of modified civilian vehicles (low profile/utility) are effectively interchangeable from an operational perspective.

The analysis found that future Special Operations Vehicle fleet should specifically include four types of vehicle:

- Mobility heavy (high endurance reconnaissance)
- Protected heavy
- Low profile/low profile utility.

How Defence considered interoperability

New Zealand Special Operations Forces do not have the capability to develop vehicles. They remain reliant on what the market can provide. In order to ensure that the project investment delivers maximum capability for minimum risk and the best value for money, the following attributes are essential in any vehicle:

- In production
- Proven in combat operations with peer forces (reliability, combat effectiveness)
- Meets basic mission requirements without modification (‘off the shelf’)
- Have sufficient weight, space and power to accept current and potential future equipment such as weapons, communications and electronic support equipment
- Easily operated by New Zealand personnel
- Proven support arrangements, both in New Zealand and on global deployment
- Compatible with our own and partners’ missions, doctrine and equipment
- Compatible with our own and partners’ strategic and tactical transportation capabilities
- Economical to own and operate.

Partner compatibility is a vital attribute. It helps ensure that there is support on deployment, and can minimise the amount of additional support equipment that needs to be deployed with the vehicle. It ensures that there is a high level of mutual understanding around mission methods and capabilities. It ensures that New Zealand can leverage from partners' developments, especially in mission-specific equipment, such as electronics. It also means that essential compliance requirements such as load cases (how equipment is safely stowed), loading cases (for example, for transporting in aircraft), protection options, mobility standards, and safety cases have all been conducted. This is a major saving in time and effort, especially for a small number of vehicles.

Stepping outside the choices made by our close partners is to invite undue risk, especially in view of the small numbers involved. New Zealand's Special Operations Forces need vehicles that can be taken into service with the minimum of time and effort, and that share a development path with others – for example, in terms of fitting new electronic and protective equipment over time. As noted earlier, developing, proving and certifying a modification to vehicles is expensive and time consuming. Overall, New Zealand requires strong reasons not to select vehicles operated by peer partners.

How Defence considered through-life costs and issues

The key financial assumptions made in the Single Stage Business Case were:

- There will be an increase in the operating costs for the new special operations vehicle fleet as the total vehicle numbers will increase. This will be reflected in an increase to the NZSAS Regiment baseline from FY 2016/17.
- Detailed rough order of magnitude costs provided are based on the project meeting existing production runs with preferred vendors.
- The life of type for the low profile commercial off-the-shelf vehicles and military off-the-shelf vehicles is 10 years (2026).
- There is a midlife upgrade planned for the military off the shelf vehicles. Funding for this is estimated at up to $7 million with an identified funding stream of the Land Transport Capability Programme Light Tactical Vehicle (Protected) Project.
- This business case is priced in New Zealand dollars, however it should be noted that during the contract negotiation process there will be a common foreign exchange risk.
- The current special operations vehicle fleet is recommended for disposal, following the introduction into service of replacements, due to sustainability and maintainability issues.

The maintenance costs were based off the average cost of in service equivalent vehicles:

- There is $1.5 million operating costs allocated each year across the life of the new Special Operations Vehicles. This funding commenced in the 2015/16 financial year and comes from the Land Transport Capability Programme during that financial year and is represented in the Four Year Resource Plan.
- The incremental operating costs changes from the current vehicle fleet to the recommended vehicle fleet. The estimated additional costs of $0.717 million are less than the amount provisioned in the current Four Year Resource Plan.
- To support the management of this mixed fleet two additional full-time personnel are required to be funded out of the allocated operating costs.
- Because of the different life of type for the varying asset categories, the depreciation amount changes over the life of the capability, with an average of $1.94 million in the first eight years and $1.58 million for the remainder.
- The calculated Whole-of-Life Cost is approximately $34.2 million.

Requirements Analysis in the Capability Definition Phase

Table One: Special Operations Vehicles Options			
Options Considered	**Advantages**	**Disadvantages**	**Cost Estimate[11] (NZ$ million)**
1. Replace current fleet 'like for like'	Lowest cost	Least flexibility	25.3
2. Adopt a Minimum mixed fleet	Flexibility across all mission types	No vehicles to cover unavailability and training	24.8
3. Adopt a Balanced mixed fleet	Flexible fleet, allows for unavailability and training	No real disadvantages	28.0
4. Adopt a Maximum mixed fleet	Allows all mission types on one specialised vehicle	Cost and resourcing	38.3

ASSESSMENT:

The Option 1 (Like for Like) fleet was heavily optimised towards the Special Reconnaissance mission, but less effective in the other three. This leaves the same limitations that the current fleet imposes, with the major difference being that new vehicles would be more capable and more reliable than those they replace.

The Option 2 (Minimum) fleet is across the four types. This covers all the missions, but increases the probability that for any given mission the number of vehicles could be inadequate, especially if even one is unavailable due to damage or breakdown. There are also no additional vehicles to allow for training, as any mission deployment would probably involve all vehicles. Capital cost is $24.8 million.

The Option 3 (Balanced) fleet allows for training in the event of deployment and provides limited cover to the possibility of loss. It also minimises the need for excessive support and other costs associated with vehicle fleets. Capital cost is $28 million.

Option 4 (Maximum) provides the maximum number of vehicles in each category. This would allow for a significant deployment based on just one particular vehicle type, while maintaining a New Zealand-based training and replacement capability. However, the last decade of operations experience proves this is unlikely – the preference is always to deploy a vehicle mix to provide more flexibility. The downsides of this option are the cost of acquisition. The ongoing cost of supporting and maintaining the additional vehicles would exceed the current resourcing of the Special Operations Forces.

Option 3, for a Balanced Mixed fleet, was recommended and accepted.

[11] Note all costs throughout the options are rough order estimates.

Description of the Capability and Operational Requirements

<table>
<tr><th>Capability Requirements</th><th>Operational Requirements - Description and Explanation</th></tr>
<tr><td>The following vehicle types are best suited to the tasks performed by New Zealand's Special Operations Forces:</td><td>The New Zealand Defence Force's most capable, agile and prepared combat troops are its Special Operations Forces. They are selected, trained, equipped and led to deploy across a broad spectrum of operations, from long-range reconnaissance to counter-terrorism. They are unique in the New Zealand Defence Force in that they are mandated to maintain a 'Fully Prepared' status across all employment contexts. This means that Special Operations Forces' lead times for deployment are very short by comparison with most New Zealand Defence Force force elements.

The core operational tasks that the Special Operations Forces undertake are listed below. These missions can take place in every sort of terrain, from open country to cities. A range of vehicles with a combination of mobility, protection, firepower, stealth, and utility is needed to perform all missions.</td></tr>
<tr><td>Mobility Heavy – provides endurance, mobility, and has ample capacity for personnel, weapons and equipment.</td><td>Special Reconnaissance: The traditional long-range reconnaissance task, where the primary objective is intelligence gathering rather than contact with the enemy. These missions can involve weeks away from base with no external support.</td></tr>
<tr><td>Protected Heavy – provides better protection for direct action and counter-terrorism tasks.</td><td>Direct Action: Engaging an adversary, rather than observing or avoiding them.</td></tr>
<tr><td rowspan="2">Low Profile/Utility – allow Special Operations Forces to adopt a low profile and undertake less overt operations, whilst retaining some combat capabilities.</td><td>Combating Terrorism: Includes responding to hostage incidents and/or protecting civilians from terrorist attack, often in populated and urbanised environments.</td></tr>
<tr><td>Support and Influence: Activities such as maintaining a presence, gathering information, mentoring, and training.</td></tr>
<tr><td colspan="2">NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations.</td></tr>
</table>

Schedule of Capability Definition Phase

Dates	Duration	Explanation
Feb 2012 – June 2015	40 months	SOV Charter – SSBC approval (project initiation to SSBC approval through Cabinet)
June 2015 – August 2016	14 months	SOV SSBC Approval to negotiate to final approval for major contract

History of Cost Estimates in the Capability Definition/ Source Selection Phase

Date	2012 (Charter)	2015 (SSBC)	2016 (Initial contract)
Costs (NZ$ million)	$30 – 31	$28	$28
Explanation of Variance	Cost estimates refined over time		

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial Estimate	As at 30 June 2018 (Forecast/Actual)
Date	2017	February 2018 (Actual)
Explanation of Variance	Delays in shipping and delivery of the contracted supplier's UK-based factory, along with the factory being relocated in the lead up to delivery contributed to this schedule variation. On delivery of the Low Profile/Utility fleets minor warranty issues were identified and delayed acceptance until February 2018.	

ACQUISITION PHASE

Description of acquisition work

In June 2015 Cabinet approved the expenditure of up to $28 million on Special Operations Vehicles and associated support and infrastructure. The Secretary of Defence was authorised to commit and approve expenditure of up to $14.400 million for the acquisition of Supacat vehicles for the Heavy Mobility fleet.

The Secretary was further authorised, in conjunction with the Chief of Defence Force, to commit and approve expenditure up to $13.600 million for multiple small separate acquisitions of the other vehicles, equipment, infrastructure and support relating to the Special Operations Vehicles project, as outlined in the Single Stage Business Case.

Accordingly a contract was negotiated and signed with Supacat PTY Ltd on 26 August 2016 for a Heavy Mobility platform. The Business Case identified Thales' Bushmaster as the preferred solution for the Protected Mobility vehicle. A Memorandum of Sale was negotiated and signed on 12 May 2017 with the Australian Department of Defence to transfer vehicles and associated equipment from surplus Australian Defence Force stock. Low Profile vehicles were purchased following a successful tender response for the Low Profile Utility. A contract was signed on 22 December 2016 with Jankel Armouring Ltd. Infrastructure requirements are being delivered by Defence Estate and Infrastructure following the receipt of tenders and selection of a preferred contractor. A contract was signed with Downers Construction Ltd.

How Defence decided to acquire the Capability Solution

Four broad options were considered for replacing the Pinzgauer.

Option	Description	Capital Cost (NZ$m)	Whole of Life[12] Cost (NZ$m)
1	Replace current fleet 'like for like'	25.3	28.8
2	Adopt a Minimum mixed fleet	24.8	30.2
3	Adopt a Balanced mixed fleet	28.0	34.2
4	Adopt a Maximum mixed fleet	38.3	46.9

1. The Option 1 (Like for Like) fleet was heavily optimised towards the Special Reconnaissance mission, but less effective in the other three, leaving the same limitations that the current fleet imposes, with the major difference being that new vehicles would be more capable and more reliable than those they replace. Because this fleet would only have the Mobility Heavy vehicle, which is the most expensive vehicle type, the overall capital cost would be $25.3 million.
2. The Option 2 (Minimum) fleet covered all the missions, but increases the probability that for any given mission the number of vehicles could be inadequate, especially if a vehicle is unavailable due to damage or breakdown. Should this occur, then Special Operations Forces may be forced to borrow, lease, or purchase other vehicles at short notice, which would increase whole-of-life costs and impact on readiness. There are also no additional vehicles to allow for training, as any mission deployment would probably involve all vehicles. Capital cost is $24.8 million.
3. The Option 3 (Balanced) fleet allowed for training in the event of deployment and provides limited cover against the possibility of loss. It also minimises the need for excessive support and other costs associated with vehicle fleets. Capital cost is $28 million.
4. Option 4 (Maximum) provided the maximum number of vehicles in each category. This would allow for a significant deployment based on just one particular vehicle type, while maintaining a New Zealand-based training and replacement capability. However, the last decade of operations experience proves this is unlikely – the preference is to deploy a vehicle mix to provide more flexibility. At $38.3 million, the cost of acquisition is well in excess of the agreed funding, and the ongoing cost of supporting and maintaining the additional vehicles would exceed the current resourcing of the Special Operations Forces.

Option 3, for a Balanced Mixed fleet, was recommended and the following suppliers selected.

Contractor for Heavy Mobility	Supacat
Contractor for Protected Heavy	Bushmasters
Contractor for Low Profile/Utility	Jankel

[12] Whole-of-Life Cost includes capital and operating costs over a notional 10 year life of type, as well as costs of asset disposal.

SOV PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	29.3
Life to date expenditure	26.1
Total forecast expenditure	29.2
Gross project variation (forecast)	0.1
Foreign exchange impact	(0.1)
Actual project variation (forecast)	0.0

Budget variation

	Date approved	Total (NZ$ million)
Original budget at Approval to Commit	17 June 2015	28.0
Current approved budget	27 March 2018	29.3
Variation on original approved budget		(1.3)
Explanation of variation		Additional $1.3 million approved as a technical adjustment for foreign exchange

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure (cumulative)	26.1
Remaining balance of approved budget	3.2
Forecast commitments	3.1

Total forecast expenditure

	Total (NZ$ million)
Approved budget	29.3
Total forecast expenditure	29.2
Gross project variation (forecast)	0.1
Foreign exchange impact	(0.1)
Actual project variation (forecast)	0.0

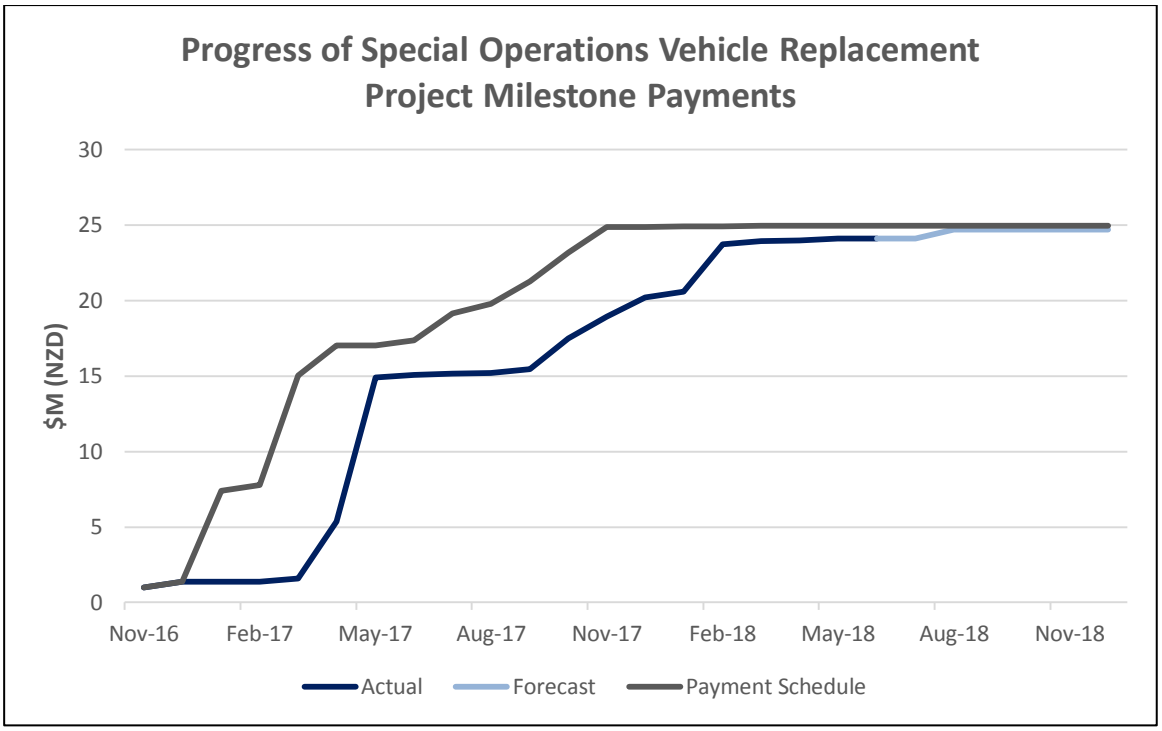
Project Contingency as at 30 June 2018

	Total (NZ$ million)
Contingency built into the budget	2.6
Total contingency expended	0.0
Remaining balance	2.6

Explanation of major contingency draw downs

There have been no major contingency draw downs to date.

Progress of SOV Replacement Project against the Milestone Payments Schedule



SCHEDULE/TIMEFRAME PROGRESS

The following dates are those in the MoU and those for contract acceptance of acquisitions.

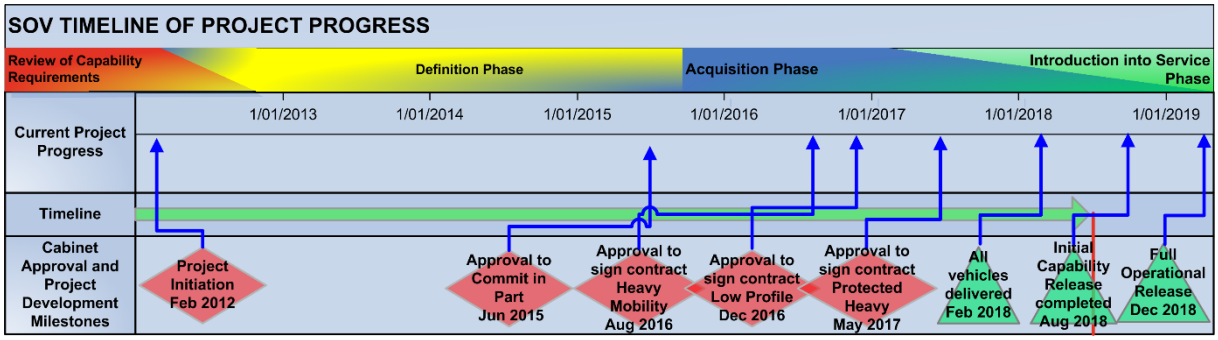
	Original forecast at Approval to Commit	30 June 2018 Forecast/Actual	Variation in acquisition phase (months)
Heavy Mobility delivery	September to November 2017	November 2017 (Actual)	0
Protected Heavy delivery	May 2017	June 2017 (Actual)	<1
Low Profile/ Utility delivery	June-July 2017	February 2018 (Actual)	7

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
June 2017	1	Protected Heavy: Vehicles were shipped in May and arrived in New Zealand on 12 June 2017, less than a month later than originally forecast.
February 2018	7	Low Profile/Utility: Delays in shipping and delivery to the contracted supplier's UK-based factory, along with that factory being relocated in the lead up to delivery contributed to this schedule variation. On delivery some issues were identified that prevented full NZTA compliance being secured for this fleet. These were resolved in January 2018.

PROJECT STATUS AS AT 30 JUNE 2018

	Capability: At 30 June 2018, an Operational Test and Evaluation Report was being prepared by NZDF for submission to Landworthiness Authority for endorsement for Heavy Mobility and Protected Mobility vehicles. The Low Profile/Utility vehicle fleets were not included in this testing process as materiel release was being managed through a separate process and forecast to be completed in July 2018.
	Schedule: There was some variance in the project's schedule for operational testing and evaluation, and interim and full operational release, with some governance milestones achieved later than forecast.
	Cost: Project expenditure remained within the Cabinet approved appropriation.



SOV DEVELOPMENTS POST 30 JUNE 2018

Materiel/full operational release of the Low Profile/Utility fleets was approved in July 2018 as forecast. Full Operational Release for Heavy Mobility and Protected Mobility vehicles will be granted once the NZDF Landworthiness Authority have closed off specific requirements that were identified during the Operational Test and Evaluation process. However, the vehicles achieved Interim Operational Release into service in August 2018.

INTRODUCTION INTO SERVICE

Description of Introduction into Service phase

The project used the Project to Unit methodology for the Introduction Into Service of SOV. This approach was based upon the Original Equipment Manufacturer (OEM) and Australian Defence Force (ADF) providing Train the Trainer instruction to 1st New Zealand Special Air Services Regiment (1NZSAS Regt) instructors who then cascade the training down throughout the remainder of the Unit.

Integrated Logistic Support (ILS) contracts have been signed with the OEMs and the ADF for through life support of the SOV fleet.

Status of the Introduction into Service Plan

The Introduction into Service Plan was signed on 12 April 2017 and is being implemented.

Schedule of Introduction into Service

	Initial Estimate	30 June 2018 Forecast/Actual	Variance (months)
Operational Test and Evaluation (OT&E) by NZDF			
1: Heavy Mobility	1: July 2018	1: June 2018 (Actual)	1: -1
2: Protected Mobility	2: Sept 2017	2: June 2018 (Actual)	2: 9
3: Low Profile/Utility	3: Oct 2017	3: OT&E Not completed (see explanation note below)	3: N/A
Initial Capability Release			
1: Heavy Mobility	1: April 2018	1: August 2018 (Forecast)	1: 4
2: Protected Mobility	2: May 2017	2: August 2018 (Forecast)	2: 15
3: Low Profile/Utility	3: Aug 2017	3: July 2018 (Forecast)	3: 11
Full Operational Release			
1: Heavy Mobility	1: July 2018	1: December 2018 (Forecast)	1: 5
2: Protected Mobility	2: Oct 2017	2: December 2018 (Forecast)	2: 14
3: Low Profile/Utility	3: Nov 2017	3: July 2018 (Forecast)	3: 8
Explanation	At 30 June 2018, an Operational Test and Evaluation Report was being prepared by NZDF for submission to Landworthiness Authority for endorsement for Heavy Mobility and Protected Mobility vehicles. The Low Profile/Utility vehicle fleets were not included in this testing process, but materiel release was approved in July 2018 as forecast. Full Operational Release will be granted once the NZDF Landworthiness Authority have closed off all requirements for the Heavy Mobility and Protected Mobility. However, the vehicles achieved Interim Operational Release into service in August 2018.		

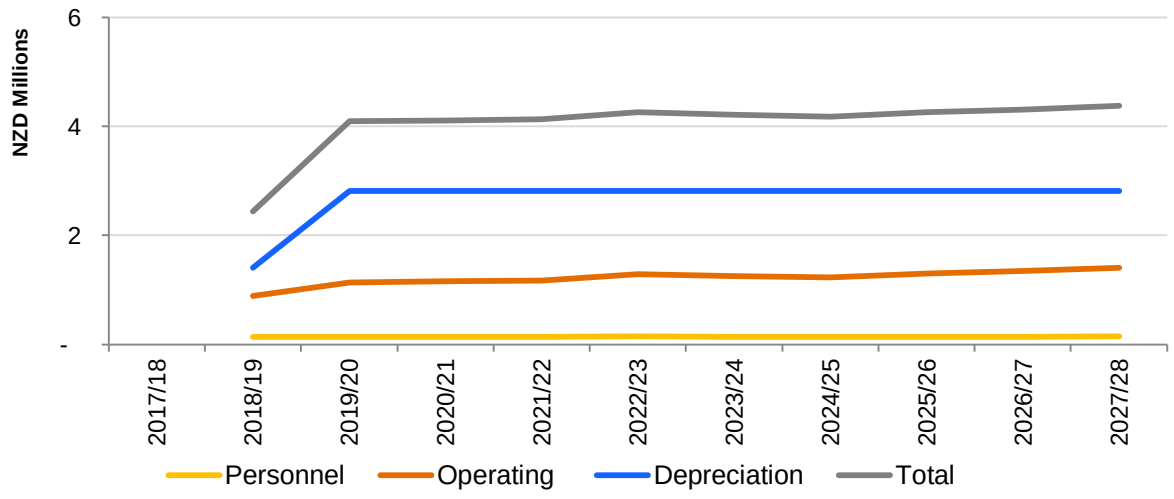
SOV OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

Operational Requirements	Requirements likely to be met	Comment
Special Reconnaissance: The traditional long-range reconnaissance task, where the primary objective is intelligence gathering rather than contact with the enemy. These missions can involve weeks away from base with no external support. (Mobility Heavy)	Yes	Capability scheduled for release in August 2018.
Direct Action: Engaging an adversary, rather than observing or avoiding them. (Protected Heavy)	Yes	Capability scheduled for release in August 2018
Combating Terrorism: Includes responding to hostage incidents and/or protecting civilians from terrorist attack, often in populated and urbanised environments. (Low Profile/Utility)	Yes	Capability scheduled for release in July 2018.
Benefits realisation is scheduled for full implementation by December 2020		

Summary of SOV Through Life Operating Cost Estimates



UNDERWATER INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE

Project Description: The Underwater Intelligence, Surveillance and Reconnaissance project is being undertaken to restore the underwater surveillance capabilities of the P-3K2 Orion to contemporary standards.

THE PURPOSE OF THIS PROJECT

For the NZDF to be a deployable and sufficiently self-reliant force, maintaining a credible intelligence, surveillance and reconnaissance (ISR) capability is important to New Zealand.

For the Underwater Intelligence, Surveillance and Reconnaissance (UWISR) project, the problem was an inability to locate and track submarines. This lead to a reduced ability to protect maritime activity, and limited deployment options for Government both for national tasking and coalition contributions.

An improved ability to protect maritime activity includes the ability to protect commercial shipping, national and foreign military vessels, and underwater natural resources.

It also provides increased assurance to Government about the ability to respond. This includes the ability to contribute credibly to coalition operations and the ability to demonstrate a credible UWISR capability.

Capability Requirements

The *Defence White Paper 2010* noted that the six P-3 Orion aircraft that have been undergoing upgrade *"…may progressively be fitted with…anti-submarine sensors, improving their combat capability and enhancing the ability of New Zealand to contribute more robustly to global efforts"*. The actual capabilities needed to achieve this included:

- advanced acoustic processing equipment
- simulation systems
- analysis facilities, and
- support equipment such as new air compressors to deploy sonobuoys.
- UWISR capability, and provide a range of response options, e.g. from surveillance to attack.

UWISR Better Business Case Milestones

Date	Approved By	Approval
23 June 2014	Cabinet	Single Stage Business Case CAB Min(14)21/8
11 July 2016	Cabinet Business Committee (with power to act)	Project Implementation Business Case CBC-16-MIN-0011

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

Submarines are covert platforms used for clandestine operations; collecting intelligence, inserting Special Forces, striking shore targets and shipping, and more generally causing insecurity by their uncertain location. Globally, 41 countries operate over 300 submarines, of which around 200 are in the Asia-Pacific region. Submarines themselves are increasing in capability – especially in submerged speed and endurance, mission systems, and the ability to avoid detection.

The direct security risk to New Zealand of submarines is low. Of more concern is the growing deployment of conventional submarines in maritime areas where New Zealand and its partners operate. Having a demonstrated capability to locate submarines provides a powerful deterrent. It removes the element of doubt in their location and surprise in their appearance, rendering them susceptible to attack.

New Zealand's Anzac frigates have underwater detection abilities, but this is limited to the immediate area surrounding the frigate and is largely for self-defence. The P-3 Orion aircraft fleet provides broader coverage and being globally deployable can enhance the ability of New Zealand to contribute to international coalition security initiatives.

The UWISR equipment that had been fitted to the P-3 fleet was obsolete and increasingly difficult to support. The rate of deterioration meant the capability would cease to work within 2-3 years, and this project sought to restore a contemporary capability to the NZDF through an upgrade of the obsolete UWISR equipment on the aircraft.

UWISR is a fundamental component of an anti-submarine warfare capability. An UWISR capability is used to search for, detect, classify, locate, track and identify sub-surface targets. Each of these steps is progressed through prior to target engagement, which is intended to deny the enemy effective use of their submarine. These capabilities can also be used for other tasks where processes involve generating, detecting and interpreting acoustic information, such as search and rescue, and marine science.

An investment logic mapping exercise was undertaken by Defence to determine the nature of the problem, the benefits that would occur from addressing that problem, and the strategic response that would achieve the benefits. This identified:

1. **The Problem:** inability to locate and track submarines over a broad area in which they may be suspected of operating.
2. **The Benefits:** improved ability to protect maritime activity and an increased assurance to Government about the ability to respond.
3. **The Strategic Response:** improve underwater detection, location, classification and tracking capability to a level acceptable to the Government and coalition partners.

How Defence analysed the requirements options in the Capability Definition phase

Options analysis included methods of capability delivery, platform options, and the capabilities required. In summary, the options analysis was as follows:

Options for Capability Delivery: this choice drives all other options or eliminates them from further consideration. The broad choices were:

- No capability
- NZDF-delivered capability
- Capability delivered by partners

- Commercially-delivered capability.

No capability: this would have been a reduction in the capability level provided by the P-3 aircraft.

Reliance on partners: this would be dependent on our partners' ability and willingness to assist, other than as part of a coalition taskforce.

Commercially-delivered capability: this concept was also considered. A service to locate and track submarines is not currently available. Effective UWISR relies on classified and sensitive inputs by participating nations and the technologies involved are some of the most heavily classified of all military capabilities.

For New Zealand to retain a sovereign UWISR capability, it had to be provided by the NZDF.

Capability Delivery Options for UWISR

	No Capability	NZDF	Partner	Commercial
Strategic Fit	Fail	Met	Fail	Fail
Operability	Met	Met	Partial	Fail
Achievability	Met	Met	Fail	Fail
Affordability	Met	Met	Partial	Fail
Risk	Fail	Met	Fail	Fail
Value	Met	Met	Partial	Fail
Sustainability	Met	Met	Fail	Fail
Conclusion	***Fail***	***Met***	***Fail***	***Fail***

Options For Platform Choice

UWISR must be undertaken by a platform that can operate over the sea or at sea. This limits the functional choices to the following:

- Sea-based (e.g. ship or seafloor sensors)
- Airborne (e.g. aircraft)
- Space-based (e.g. satellite)
- Sub-surface (e.g. submarine)
- Hybrid (e.g. a helicopter-borne capability based on a ship).

Analysis of Platform Options

Of these alternatives, **space-based** and **sub-surface** platforms or systems can be dismissed on cost and policy grounds.

Surface vessels lack the strategic mobility and responsiveness of aircraft, although they can have greater persistence.

A **hybrid** model requires ship-based helicopters with sophisticated on-board UWISR capacity. The current and future NZDF shipboard helicopter does not have these systems,

although it is well equipped to act as a fast response weapons carrier in support of anti-submarine warfare operations.

The NZDF has operated the P-3 Orion aircraft as an airborne UWISR platform. The P-3 has desirable characteristics for UWISR, including high transit speed, long endurance, excellent low level manoeuvrability and the room to carry the personnel, systems and weapons required for the task.

Platform Options

	Sea-based	Airborne	Space-based	Sub-surface	Hybrid
Strategic fit	Met	Met	Fail	Fail	Met
Operability	Met	Met	Fail	Fail	Met
Achievability	Partial	Met	Fail	Fail	Partial
Affordability	Partial	Met	Fail	Fail	Partial
Risk	Partial	Met	Fail	Fail	Met
Value	Partial	Met	Fail	Fail	Partial
Sustainability	Partial	Met	Fail	Fail	Partial
Conclusion	***Partial***	***Met***	***Fail***	***Fail***	***Partial***

As a result of the analysis conducted, an upgrade to the existing UWISR capabilities of the NZDF's fleet of P-3 Orion aircraft was the recommended option.

Options to upgrade the P-3 Orion

There are a number of methods generally used to detect submarines: detection on the surface through visual and electronic surveillance, detection of above-water transmissions, detection using underwater active and passive acoustic sensors, and magnetic signature detection. The P-3 Orions have good surface and above-water detection capabilities but lack suitable underwater detection capabilities. A Multi Criteria Decision Analysis (MCDA) was used to determine a preferred UWISR level of capability with supporting options.

Three investment options with varying levels of functionality and one non-investment option were developed. Option 0 captured the impact of not investing in an UWISR capability. Investment options 1 – 3 were based on increasing levels of acoustic processor and sonobuoy sophistication, and detection capability. Whole Of Life Cost (WOLC) (Net Present Cost (NPC)) was calculated over 10 years.

The MCDA concluded that the best value solution was an advanced acoustic processor, with matched planning, training, and analysis tools. Along with this, an upgrade of a critical component of the sonobuoy delivery system – the air compressor – was also recommended. A lower specification acoustic processor saved money, but delivered less capability and has higher overall operating costs. Magnetic Anomaly Detection (MAD) equipment is required for Options 1 and 2 to compensate for limitations in acoustic processor capability. It would be a useful addition to Option 3, but not at the expense of acoustic sophistication, as acoustics is the primary UWISR detection method.

Option 3 (no MAD) provided the best benefit/cost ratio when compared with Options 1 and 2. The initial capital cost was lower than Option 2, operating costs were the lowest per annum and best overall performance was gained through use of an advanced acoustic processor.

How Defence considered interoperability

UWISR involves interpreting acoustic information both above the surface and below it. Not only is it essential to detecting submarine activity, but the submarines operated by our partners rely on the acoustic information we collect to monitor and track ships of interest.

But collecting this information is a niche capability. Few countries have the required skilled operators, access to very sensitive acoustic intelligence, and the requisite onboard equipment. Of the operations undertaken by the P-3 Orion fleet, UWISR is the most difficult and demanding, requiring expertise that has been built and maintained over many decades in a very co-operative manner. Having a credible UWISR capability strengthens our reputation as a valued partner.

How Defence considered through-life costs and issues

The Defence Capital Plan agreed by Cabinet in December 2013 [CAB Min (13) 43/3 refers] included a capital cost provision of up to $31m for UWISR. This allowed the recommended Option 3.

Operating costs for the systems being replaced are around $11.86 million per year. Following the operational release of the new systems, operating costs are expected to increase by $0.55 million per year. This increase is due to Defence seeking a Through Life Support Agreement. The cost of the support agreement is partially offset by improvements in simulation training, which will reduce annual sonobuoy usage.

The *Defence White Paper 2016* indicative funding envelope provided an additional $0.40 million in funding for this capability. The balance of $0.15 million per year will be managed within existing Defence Force baselines.

No reductions in personnel cost or flying hours with the new system are anticipated.

The Defence Force's assumption is that the new system will cost less to maintain than the current system due to improved reliability. However, these savings cannot be quantified as the cost of maintaining the current system is not currently captured separately from overall P-3 maintenance. No savings have therefore been factored into the figures.

Requirements Analysis in the Capability Definition Phase

Options considered	Cost Estimates (NZ$ million)	Advantages	Disadvantages
Option 0: Remove UWISR Capability	0.12m (to remove equipment)	Cost savings	No capability
Option 1: Entry Level UWISR	22.0-25.1	Lower cost	Entry-level systems lack the detection, tracking and classification tools offered by more capable systems.
Option 2: Contemporary UWISR Capability	29.5-31.3	Adequate performance	Probable longevity. There is a significant risk that this technology would not be sustainable for the

			remaining life of the aircraft. MAD is desirable with this option. The combined performance of MAD and this level of acoustic suite is not as good as that available from a more sophisticated acoustic suite without MAD
Option 3: Advanced UWISR Capability	26.1-28.0	High performance Future proofed	
ASSESSMENT: On the basis of delivery of benefits, meeting all safety requirements and affordability (capital and operating), option 3 was selected.			

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:	**Operational Requirements** necessary to support the capability include:
The *Defence White Paper 2010* noted that the six P-3 Orion aircraft "…may progressively be fitted with…anti-submarine sensors, improving their combat capability and enhancing the ability of New Zealand to contribute more robustly to global efforts". The actual capabilities needed to achieve this included: • Advanced acoustic processing equipment • Simulation systems • Analysis facilities, and • Support equipment, such as new air compressors to deploy sonobuoys	Key user requirements drawn out of the policy documents are summarised below: • Airborne Anti-Submarine Warfare is a combat capability that is intended to be used to enhance New Zealand's ability to contribute robustly to global security efforts. • Provide effective force protection for maritime assets from sub-surface threats. • Provide direct support in eliminating the sub-surface threat to friendly maritime forces and open Sea Lanes of Communication. Benefits summary: • Improve ability to protect maritime activity, and • Increase assurance to government regarding maritime response options.
NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations	

Schedule of Capability Definition Phase

Dates	Duration	Note
August 2012 – June 2014	22 months	Charter to SSBC approval by Cabinet – includes development of SSBC and options
June 2014 – July 2016	25 months	SSBC approval to PIBC approval by Cabinet Business Committee (with power to act) – includes tender selection and contract negotiations

History of Cost Estimates in the Capability Definition Phase

Date	2014 (SSBC)	2016 (PIBC)
Costs (NZ$ million)	31.0	36.8
Explanation of Variance	2016 figure was within 2016 Capital Plan estimate of $36.8 million. The increase from 2014 includes a $3.28 million provision for contingency, and incorporates escalation across planning years.	

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	At Contract Signing	30 June 2018 Actual
Date	April 2016 (Acceptance test and evaluation ends)	January 2018 (First aircraft installation accepted)	June 2018 (First aircraft accepted)
Explanation of Variance	The initial schedule assumed development of the Project Implementation Business Case would take six months from Single Stage Business Case (SSBC) approval. SSBC was not approved until June 2014. It also assumed installation would take 15 months from contract signature to aircraft ready to accept. The actual installation schedule (17 months) was developed during contract negotiations leading up to the PIBC approval and Approval to Commit Funds in July 2016. The delay until June 2018 was the result of Sonobuoy Positioning System software issues identified during the design, which were resolved in March 2018. A separate software testing activity was held once the problem was resolved and design acceptance finally occurred in June 2018.		

ACQUISITION PHASE

Description of acquisition work

The acquisition contract with Boeing is for the commercial purchase of new underwater surveillance systems to be fitted to the Royal New Zealand Air Force's P-3 fleet. The contract

delivers a turnkey solution and includes all necessary hardware, software development and integration, upgrades to the ground-based P-3 training and software testing facility in Auckland, technician and operator training and a spares package. A Through Life Support Agreement with Boeing was signed concurrently by the Defence Force. The first three years of operation will be covered by warranty.

How Defence decided to acquire the Capability Solution

Cabinet approved Option 3: Advanced Capability in June 2014, as it was the only option that could provide capability at an acceptable level until the expected retirement of the P-3s in the next decade. Option 3 was also cheaper than Option 2: Contemporary Level Capability as the advanced acoustic processor removed the need for a supporting magnetic anomaly detector, resulting in a significant cost saving.

Defence issued a Request for Tender in March 2015 with a deadline for response of June 2015. Four companies submitted proposals. All proposals were evaluated as compliant in the phase one evaluation. Proposals by two companies, Boeing Advanced Technology Programs (United States) and Ultra Electronics (United Kingdom) emerged as clear leaders in the phase two evaluation, which considered operational; technical and certification; and logistical support and life-cycle cost performance. However, Boeing's proposal received the highest score for overall performance and schedule and was the only proposal to come within the funding provision. Accordingly Boeing became the sole preferred supplier.

Boeing is providing equipment that either is or will be fitted to the United States Navy and Royal Australian Air Force P-8A Poseidon fleets. This gives Defence confidence in the quality, certifiability and ongoing supportability of the systems. It also guarantees the systems will be interoperable with partners.

The Ministry of Defence conducted due diligence in the United States in November 2015, visiting Boeing Advanced Technology Programs at Huntington Beach, California, and Germane (the manufacturer of the acoustic processor) at Chantilly, Virginia, with no issues raised during either visit. The United States Navy P-8A Program Office was also visited to discuss the acquisition process insofar as it involved Boeing, with no major issues raised.

Contract Status as at 30 June 2018

The acquisition contract with Boeing is for the commercial purchase of new underwater surveillance systems to be fitted to the Royal New Zealand Air Force's P-3 fleet. The contract will deliver a turnkey solution and includes all necessary hardware, software, development and integration, installation and upgrades to the ground-based P-3 training and software testing facility, technician and operator training and a spares package. A Through Life Support Contract has been signed with Boeing concurrently by the Defence Force.

Contractor for the UWISR project	Boeing

UWISR PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	37.1
Life to date expenditure	30.9

Total forecast expenditure	36.6
Gross project variation (forecast)	0.5
Foreign exchange impact	0.1
Actual project variation (forecast)	0.6

Budget variation

	Date approved	Total (NZ$ million)
Original budget at Approval to Commit	11 July 2016	36.4
Current approved budget	27 March 2018	37.1
Variation on original approved budget		0.7
Explanation of variation		Additional $0.7 million approved as a technical adjustment for foreign exchange

Project expenditure to 30 June 2018

	Total (NZ$ million)
Life to date expenditure (cumulative)	30.9
Remaining balance of approved budget	6.2
Forecast commitments	5.7

Total forecast expenditure

	Total (NZ$ million)
Approved budget	37.1
Total forecast expenditure	36.6
Gross project variation (forecast)	0.5
Foreign exchange impact	0.1
Actual project variation (forecast)	0.6
Variance explanation	N/A

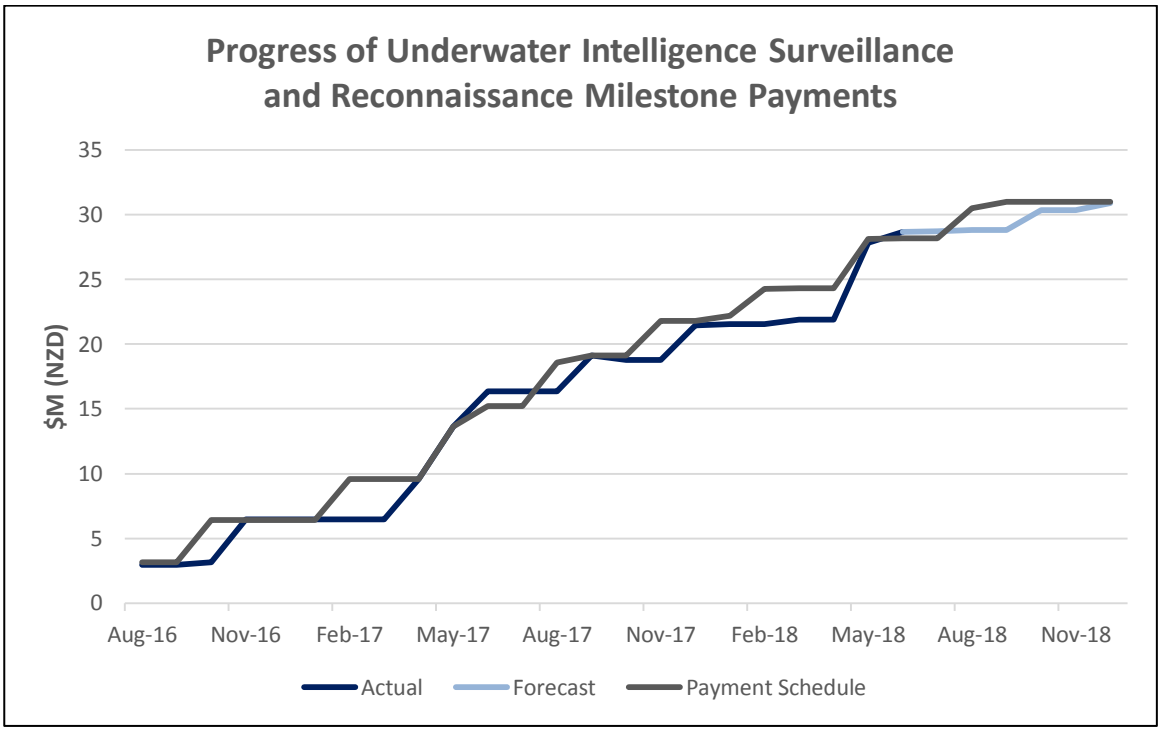
Project Contingency as at 30 June 2018

	Total (NZ$ million)
Contingency built into the budget	3.3
Total contingency expended	2.1
Remaining balance	1.2

Explanation of major contingency draw downs

Draw down	Total (NZ$m)	Explanation
27 March 2017	2.1	A contingency draw down of $2.1 million was approved by the Secretary of Defence to fund the implementation of enhanced functionality of the UWISR system proposed by an Engineering Change Proposal. The enhanced functionality comprises the implementation of sonobouy positioning system capability for the upgraded P-3K2 acoustic system and will enable the employment of lower cost sonobuoys, without global positioning system componentry, and allow the P-3K2 to maintain geolocation of the sonobouy without the need for low level operations to overfly each buoy in the deployed pattern. The implementation of the sonobouy positioning system was approved on the basis of its providing enhanced benefits realisation likelihood through a whole-of-life cost neutral change to the UWISR capability project.

Progress of Underwater Intelligence, Surveillance and Reconnaissance Milestone Payments



SCHEDULE/TIMEFRAME PROGRESS

The following dates are those for contract acceptance of key deliverables.

	Original forecast at Approval to Commit	30 June 2018 Forecast/Actual	Variation in acquisition phase (months)
System Requirements Review	31 October 2016	31 October 2016 (Actual)	Nil
Final Design Review	07 February 2017	15 March 2017 (Actual)	1
Sonobouy Positioning System Engineering Change Proposal Approval	N/A	28 March 2017 (Actual)	N/A
Final Test Verification and Test Acceptance Review	01 September 2017	8 December 2017 (Actual)	3
Approval to Modify Aircraft	18 September 2017	16 October 2017 (Actual)	<1

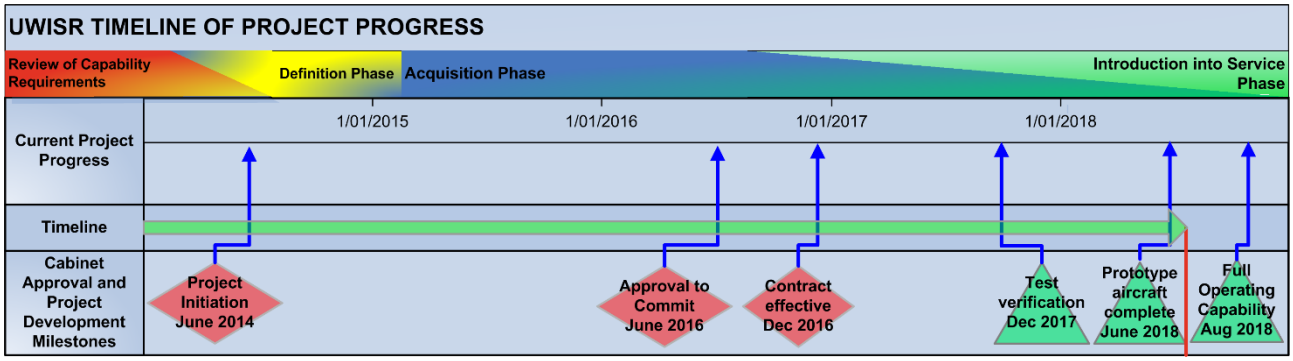
Prototype Aircraft Accepted	12 February 2018	11 June 2018 (Actual)	4
Aircraft 2 Accepted	07 May 2018	11 June 2018 (Actual)	1
Aircraft 3 Accepted	05 June 2018	August 2018 (Forecast)	2
Aircraft 4 Accepted	05 July 2018	September 2018 (Forecast)	2
Aircraft 5 Accepted	02 August 2018	October 2018 (Forecast)	2
Aircraft 6 Accepted	23 August 2018	December 2018 (Forecast)	4

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
15 March 2017	1	Design review re-scheduled to occur after integration event rather than before as originally scheduled. No impact on overall schedule.
8 December 2017	3	The delay occurred as a result of problems found during the implementation of software for the sonobuoy positioning system. The decision was made to exclude the software from the Data Management System until that problem was resolved, which occurred in March 2018. This had a flow on effective for the prototype aircraft and Aircraft 2 Accepted milestones as shown below.
11 June 2018	4	The acceptance of the Prototype Aircraft was delayed by the sonobuoy positioning system software issue as outlined above.
11 June 2018	1	The acceptance of the second aircraft was also delayed by the sonobuoy positioning system software issue, although the delay was minor due to it being modified concurrently with the prototype aircraft.

PROJECT STATUS AS AT 30 JUNE 2018

	Capability: Capability has been contracted and is in the production/delivery phase.
	Schedule: The project schedule is based on the dates from the Cabinet approval. There are minor changes in the forecast schedule primarily based on the one month between Cabinet approval and contract signing. The project is on track for completion of the final aircraft modifications in December 2018.
	Cost: The project budget is on track and remains within the Cabinet approval. Contingency funding was approved for the implementation of the sonobuoy positioning system.



UWISR DEVELOPMENTS POST 30 JUNE 2018

Following the end of the year in review, the upgrade work for all aircraft saw modifications on the final aircraft completed in March 2019. Full operational release was approved in February 2019.

INTRODUCTION INTO SERVICE

Description of Introduction into Service phase

The Introduction into Service of the Underwater Intelligence, Surveillance and Reconnaissance (UWISR) project includes the effort required for the project to take the systems provided by the acquisition phase of the UWISR project until transfer to in-service has been completed. It includes Through Life Support (TLS), for which an agreement has been signed by NZDF in conjunction with MoD's acquisition contract. TLS details will be captured by the NZDF and developed into the P-3K2 UWISR Life Cycle Management Plan.

Introduction into Service excludes any organisational effort required to introduce any new sonobuoy types into service. This activity will be managed by the NZDF under normal modification processes. The use of existing sonobuoy stock types, or prospective replacements with the upgraded UWISR systems will be validated as part of the UWISR capability acceptance process.

The Introduction into Service schedule directly linked to the Acquisition schedule. Initial activities are related to training; following delivery of the prototype aircraft, Introduction into Service activities including Test and Development and Operational Evaluation will be required and are expected to be completed within six months of prototype delivery. Some capabilities, such as Acoustic Intelligence, will be operationally ready earlier than this timeframe; however there will be no interim

operational capability statements prior to the full capability release due to the short period of time between prototype delivery and the completion of Introduction into Service.

Status of the Introduction into Service Plan

Introduction into Service had been expected to be completed by mid-2018, with the majority of effort carried out by No 5 SQN, which operates the P-3K2 aircraft that have been fitted with the updated systems. Some of this effort has overlapped with the Acquisition and In Services phases, involving co-ordination with the Ministry of Defence and NZDF units.

Schedule of Introduction into Service

	Initial Estimate	30 June 2018 Forecast/Actual	Variance (months)
Early Access accepted by Crown	January 2018	February 2018 (Actual)	1
Initial Operating Capability (IOC) accepted	April 2018	June 2018 (Actual)	2
Full Operational Capability (FOC) accepted	July 2018	August 2018 (Forecast)	-
Explanation	Early access was provided to the Crown when the aircraft returned to RNZAF Base Auckland following modification. Although the aircraft wasn't formally accepted until June 2018 the aircraft was able to be used for introduction into service tasks. IOC occurred in conjunction with acceptance of the design in June 2018. FOC flight testing was completed at the end of July 2018 at Exercise RIMPAC but the report will take a few months to be completed by the RNZAF.		

UWISR OPERATIONAL CAPABILITY

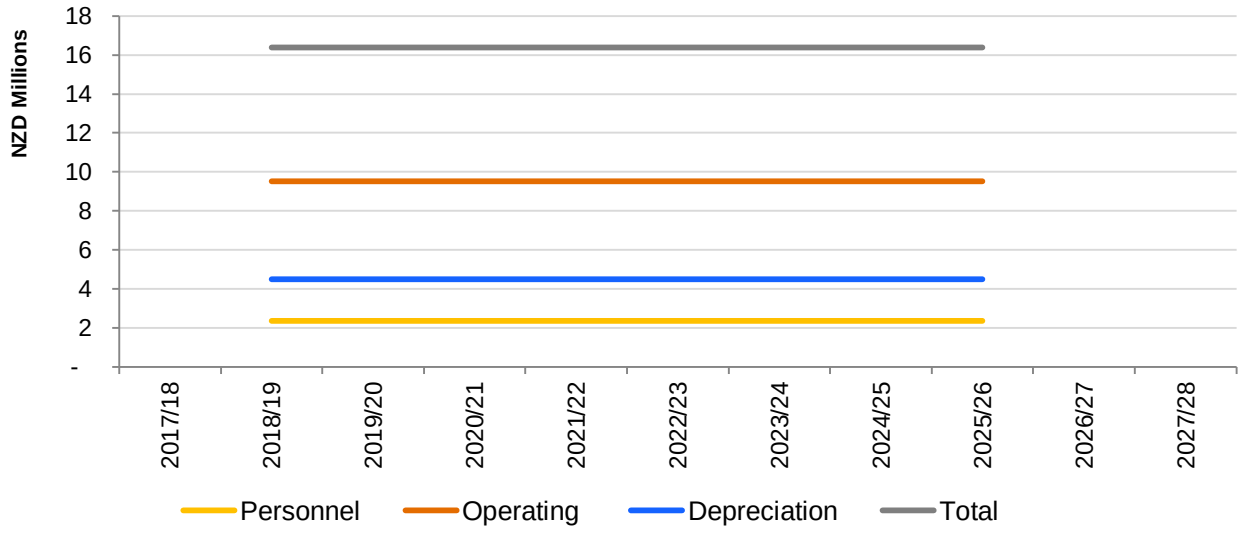
Progress towards Delivery of Operational Requirements as at 30 June 2018

Note: these are subject to change as the project progresses and solutions are implemented.

Operational Requirements	Requirement likely to be met	Comment
Improved ability to protect maritime activity and assets	Yes	The new system has an improved ability to detect, localise, classify, track and attack submarines.
Increased assurance to Government of response options	Yes	The new system has an improved ability to contribute to coalition underwater surveillance or anti-submarine operations.

Airborne Anti-Submarine Warfare (ASW) is a combat capability that is intended to be used to enhance New Zealand's ability to contribute robustly to global security efforts	Yes	The new system will increase the ability for P-3K2 ASW systems to reach a Directed Level of ASW Capability.
Provide effective force protection for maritime assets from sub-surface threats	Yes	The new system will be able to monitor a greater underwater area for natural or man-made activity.
Provide direct support in eliminating the sub-surface threat to friendly maritime forces and open Sea Lanes of Communication	Yes	The new system will be interoperable with New Zealand and allied maritime forces.
Benefits realisation is scheduled for full implementation by 2018.		

Summary of UWISR Capability Through Life Operating Cost Estimates



NETWORK ENABLED ARMY TRANCHE ONE

Background: Network Enabled Army (NEA) Tranche One is to deliver modern communications to the land force units most often deployed by the Government – Special Operations Forces (SOF); and a land force commitment, including infantry, a Task Group Headquarters and communications personnel, of around 200 personnel. It is part of a wider NEA Programme.

THE PURPOSE OF THIS PROJECT IN THE CONTEXT OF THE NEA PROGRAMME

The NEA Programme addresses limitations of current Army and Special Forces Command, Control, Communications, Computers (C4), Intelligence, Surveillance and Reconnaissance (ISR) capabilities. The importance of modern networking capabilities has been underscored by recent operational experiences, particularly in Afghanistan.

The Programme's origins lie within several projects that have evolved over time. Starting as the ISR Project in 1994, this merged with the Communications Project in 2004 to become Land C4ISR. In 2010 the project combined with three others; Electronic Warfare, Combat Net Radio Replacement and Special Operations to become what is known today as the NEA Programme.

The Programme will provide the technology the Army needs, along with the concepts, training and support that are needed to make it work. It prioritises the needs of front line soldiers and their commanders, giving them the capabilities they need without burdening them with unnecessary equipment and capability. It allows for expansion and development over time.

The strategic C4 benefits of the NEA Programme are:

- Improved interoperability
- Improved Common Operating Picture (COP)
- Improved ability to plan
- Improved information management
- Improved ability to pass data
- Improved situational awareness
- Improved ability to exercise C2.

The Programme is planned to roll out in four discrete tranches through to 2025 - 2026. Each tranche will provide a capability increase in itself, as well as building more capability on what is already in place. Managing NEA in successive tranches allows new technologies to be introduced as they mature, ensures that there are ongoing 'off ramps' to evaluate progress and if necessary change priorities, and ensures that the programme progresses at a rate that can be managed effectively and does not overwhelm the users.

At the completion of Tranche One the basic network architecture for future tranches will be in place, including key software, battle management systems and communications methods. The required levels of interoperability with Army's Joint, Interagency and Multinational partners will have been achieved for the force elements receiving the NEA Capability in Tranche One.

While Tranche One is underway the Programme has commenced the definition phase in relation to Tranche Two.

Tranche One

The Tranche One Project equips Special Operations Forces, a deployable Task Group Headquarters, and a Light Infantry Company. This covers the requirements of most land deployments. It also includes smaller headquarters units, and training rotation forces for extended deployments. It puts in place the overall architecture to allow expansion and development over time; provides support, evaluation and testing processes; and establishes key supplier relationships.

Tranche One has capital funding of $106 million and operating costs of $36.4 million approved in 2015 to spend over the next four years.

ACQUISITION PHASE

In April 2015, Cabinet approved NEA Tranche One funding for new digital radios and associated equipment as part of the NEA Programme (CAB Min (15) 11/7 refers).

Tranche One comprises five related capability sets, which have been summarised below.

In September 2017 the date for the Final Operating Capability for Tranche One was revised from June 2018 to 29 June 2020. This milestone was re-baselined within the updated NEA Programme Business Case approved by the Defence Capability Management Group in September 2017.

How Defence decided to acquire the Capability Solution

NEA Tranche One has a range of five inter-linked capability sets that are being delivered through a series of acquisitions. They were developed through the NEA Programme Business Case. This was referred to the Minister of Defence and provided the basis for Tranche One approval by Cabinet.

Description of acquisition work

1. Integration, Testing, Training, Evaluation and Experimentation

This includes most of the programme services that support the overall development of NEA, such as testing and evaluation of potential hardware and software, integration between capability sets, training for the operation and support to NEA, configuration management for the overall system and related services. It includes a physical test, reference and evaluation centre, based initially at Linton Camp (the main operational unit base) and with staff at Devonport and Papakura providing training, capability systems support, and transition services. A new User Centre will be built at Linton to directly support reference and evaluations and training.

An Engineering Centre has been established at Trentham Camp (as this is the site for the broader support elements for the Army) to provide deeper support to acquisition, integration and test and evaluation activities; including research and integration of NEA capabilities with Land, Air, Maritime, and Special Forces. A new Engineering Centre – the Test, Reference and Evaluation Capability (TREC) Centre – will be built at Trentham and is expected to be completed in the second half of 2018[13].

2. Common Universal Bearer System (CUBS)

The CUBS system essentially combines strategic and tactical communications systems with computer infrastructure to provide the means of transmitting and receiving voice and data

[13] This was achieved, with the formal opening of the new TREC Centre held on 27 September 2018.

communications between the command posts, command teams and liaison teams within the land force Task Groups and deployed SOF elements. It interconnects force elements through terrestrial and/or satellite bearer systems and provides the necessary infrastructure to host collaboration and information services. The CUBS computer infrastructure will be, in essence, a deployable node of the Defence Information Environment.

3. Common Command Post Operating Environment (CCPOE)

The CCPOE project establishes a set of standard operating procedures, equipment, and service applications suitable for land forces and SOF and that are interoperable with the NZDF and other allied systems. These will be underpinned by an information infrastructure that hosts a set of information services over a number of different networks. The key components of CCPOE are:

a) The IT systems (e.g. computers, displays and software required to access, manage and display the information carried across the CUBS).

b) The operational and tactical core services that will provide a battle management system for use at the Task Group and Sub Unit Headquarters layer.

c) The command post infrastructure, including shelters, generators, environmental management and furniture. Tendering for the remaining CCPOE capability is advancing with the last major package posted on the Government Electronic Transaction System (GETS) on 15 June 2017. This is for the Medium Accommodation Shelter Trailer System (MASTS) that provides trailers, environmental and power generation.

d) A training environment that will enable skill levels across the Army. This includes establishing a training centre of excellence, the delivery of training to Headquarters staff and providing access to battle management systems to officers and soldiers when they are in garrison and during field training.

4. Mobile Tactical Command Systems (MTCS)

The MTCS capability consists of enhanced network-capable digital combat radios and their peripherals, combined with a battlefield management system, to allow secure mobile communications networks in support of high tempo, dispersed operations. The digital combat radio environment includes line of sight and beyond line of sight technology to connect soldiers, platforms and command post at all levels of a Task Group/Battalion Group. MTCS will deliver a mobile tactical internet providing voice, data and position location indication. Interoperability with the NZ Army's Command Post level C4 systems, and joint partners is of particular importance.

Registration of Interest (for the core radios) were received on 29 May 2017 and were being evaluated. A Request for Proposals (RFP) process for the Core Radios has resulted in the engagement of the preferred respondant. Contract execution of this engagement was expected to be achieved by September 2018.

5. Special Forces Electronic Warfare Refresh

This Electronic Warfare refresh was handled as an Urgent Operational Requirement, with the NZDF Defence Capital Acquisitions staff undertaking acquisitions. This work has now been completed.

All Tranche One NEA capabilities are being delivered concurrently to the Special Forces. This ensures functional interoperability whilst allowing the specific Special Forces requirements to be met. It also ensures that the experience and learnings from Special Forces operations feed back through NEA to support the wider Army.

In summary

Each of the above capability sets are in turn broken down into smaller projects, to ensure that a functional capability that meets user requirements is delivered, that risk is mitigated, advantage

can be taken of ongoing technical developments, and to ensure that capability development occurs at a rate that the users can absorb.

Where relevant, NEA builds on extensive work and experience already resident within the NZDF, including the Army's experimental networking system (TANE), operational experience, and the experiences of New Zealand's key partners.

The broad breakdown of the $106 million approval by Capability Set is shown below. These ratios may change as the Tranche evolves.

Tranche One Capability Sets	NEA Reference	Capital Cost (NZ$ million)
Integration, testing, training, and evaluation	Programme Services	17.4
Mobile satellite terminals, routers, and servers	CUBS	26.5
Headquarters equipment and full network software	CCPOE	5.0
Mobile Tactical Radios	MTCS	46.8
Special Forces electronic warfare refresh	NZSOF EW	3.5
Contingency	Contingency	6.8
Total		106.0

Note that contingency is held within the appropriation baseline and is not subject to drawdown approvals.

SCHEDULE/TIMEFRAME/PROGRESS

The Tranche One Acquisition Phase Charter went through the Defence NEA Governance process in April 2016. This established the agreed schedule.

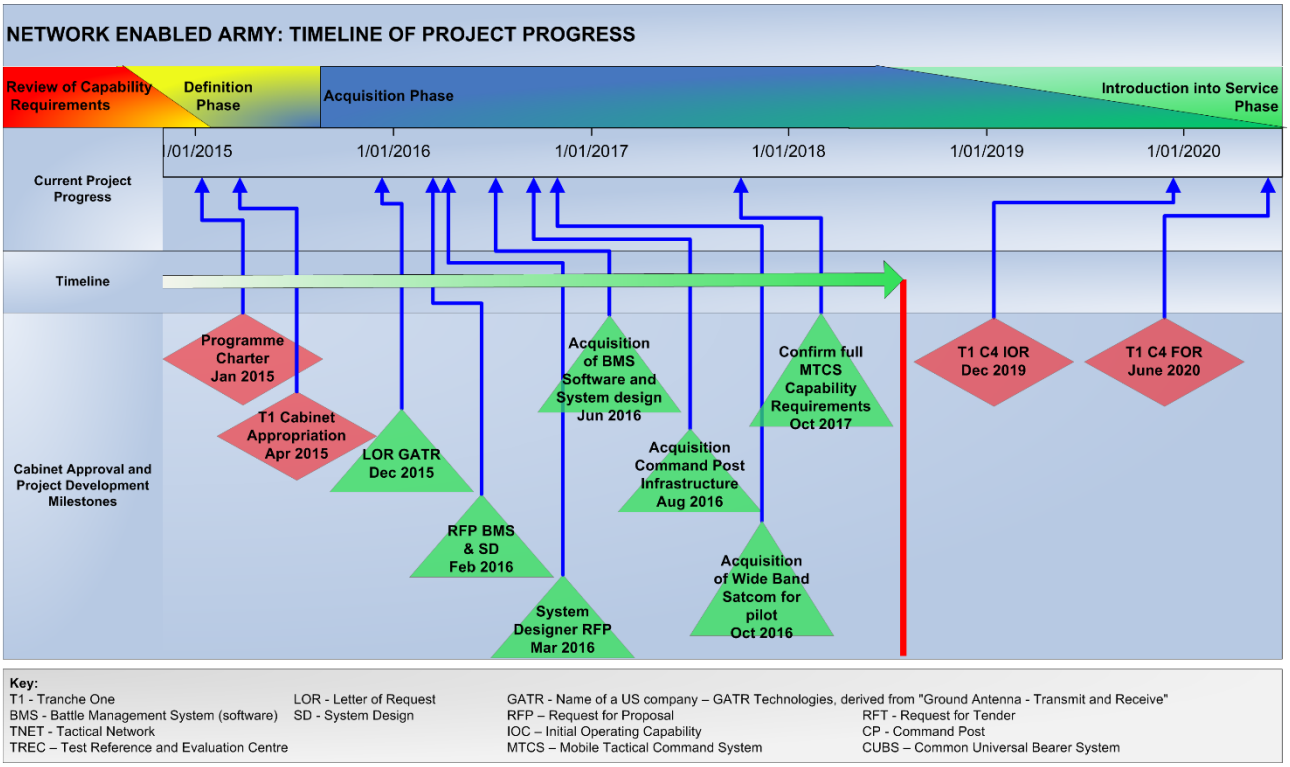
Tranche One Operational Release was originally due for completion by July 2018, but was re-baselined to 29 June 2020 in the updated NEA Programme Business Case approved by the Defence Capability Management Board Co-Chairs 8 September 2017.

Tranche 1 is scheduled to complete by June 2020. The initial Acquisition Timetable is not yet finalised.

NEA PROJECT STATUS AS AT 30 JUNE 2018

	Capability: The project overall is suitably under control with active management addressing emerging challenges. Despite the inherent size and complexity of the project, appropriate systems are in place to delivery Tranche One successfully.
	Schedule: The re-baselining of Operational Release to June 2020 means NEA Tranche One is operating to the schedule approved in September 2017, however some key project dates are forecast to be achieved later than planned.

Cost: As the workstreams are developing requirements and engaging with the market, costs are being identified. However the project budget is largely uncommitted at this time and issues and mitigations will be presented as they become clearer.



DEVELOPMENTS POST 30 JUNE 2018

The MTCS Request for Proposals (RFP) process for the Core Radios resulted in the engagement of the preferred respondent. While contract execution of this engagement was expected to be achieved by 30 November 2018, the contract was executed with Harris Defence Australia less than one month later on 21 December 2018.

Proposals received during the RFP process indicated project timeframes in relation to MTCS will push the Tranche One critical path out to July 2021. This has elevated the schedule status to red. The start of Tranche Two of the NEA Programme will impact on the delivery schedule, but once the Tranche Two Single Stage Business Case is submitted, its approval offers an opportunity for the Tranche One schedule to be re-baselined. Once revised dates are agreed, the schedule performance indicator will return to green.

NEA PROJECT BUDGET

Approved budget and expenditure

	Total (NZ$ million)
Approved budget	106.00
Life to date expenditure	35.8
Total forecast expenditure	106.4

Gross project variation (forecast)	(0.4)
Foreign exchange impact	0.9
Actual project variation (forecast)	0.5

Budget variation

	Date approved	Total (NZ$ million)
Original budget at Approval to Commit	1 March 2015	106.0
Variation on original approved budget		0.0

Project expenditure to 30 June 2018

Total (NZ$ million)	
Life to date expenditure (cumulative)	35.8
Remaining balance of approved budget	70.2
Forecast commitments	70.6

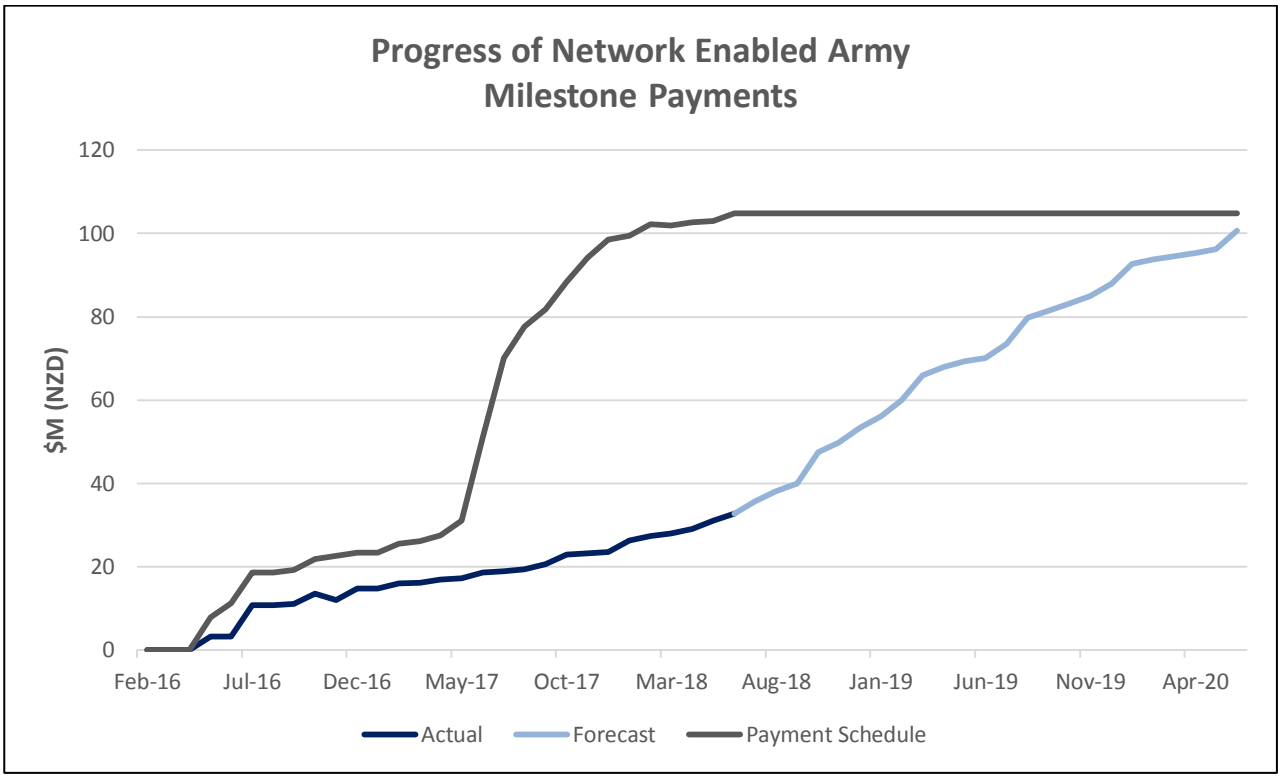
Total forecast expenditure

Total (NZ$ million)	
Approved budget	106.0
Total forecast expenditure	106.4
Gross project variation (forecast)	(0.4)
FOREX impact	0.9
Actual project variation (forecast)	0.5

Project Contingency as at 30 June 2018

NEA Tranche One Project contingency is not handled as a separate item. It is embedded in the overall Programme.

Progress of NEA Tranche One Milestone Payments



SCHEDULE/TIMEFRAME PROGRESS

	Original estimate at Approval to Commit	30 June 2018 Forecast/Actual	Variation in acquisition phase (months)
Interim Operational Release	-	December 2019 (Forecast)	-
Full Operational Release	July 2018	June 2020 (Forecast)[14]	24

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
8 September 2017	24	NEA Programme Business Case update revised the forecast Full Operational Release, reflecting that the acquisition of the radio fleet that will underpin the MTCS had begun, but will require a further two years to complete.

[14] See Developments Post 30 June 2018 on page 117.

INTRODUCTION INTO SERVICE

Description of Introduction into Service Phase

Planning for the Introduction into Service phase has commenced and responsibilities and processes have been reviewed and confirmed. The key participants are the Programme Team and Project Team, Defence Logistics Command, Training and Doctrine Command and the receiving units. The Programme Business Change Manager has worked with Army to identify business change requirements across the organisation.

Status of the Introduction into Service Plan

Introduction into Service plans will be produced for the systems that will be delivered under Tranche 1 acquisition.

SCHEDULE OF INTRODUCTION INTO SERVICE

	Initial Forecast	30 June 2018 (Forecast/Actual)	Variance (months)
Special Forces Electronic Warfare Introduction into Service complete	June 2015	May 2016 (Actual)	11
Special Forces Electronic Warfare achieve directed operating capability	September 2015	February 2017 (Actual)	17
Battalion Headquarters Command Post Systems Introduction into Service complete	December 2017	From September 2017 workstreams were working to deliver capability against the following dates Interim Operational Release December 2019 (Forecast) Full Operational Release June 2020 (Forecast)	N/A
Battalion Headquarters Command Post operational test and evaluation (OT&E)	June 2018		N/A
Battalion Headquarters Command Post achieve directed level of capability	June 2018		N/A
CUBS Wide Band SATCOM Introduction into Service	March 2018		N/A
Explanation	The delay in achieving the Special Forces Electronic Warfare capability related to a delay in the delivery of two sub-capabilities, however this was reported as having limited impact. The introduction into service was reported as delivering a significant enhancement to the Special Forces' capability.		

	Initial Forecast	30 June 2018 (Forecast/Actual)	Variance (months)
	From September 2017 IOR and FOR dates for capability delivery under Tranche One were applied across all capability workstreams, as IOR and FOR will be achieved when all workstreams within the Tranche have been delivered. It is anticipated that when an investment decision is sought in relation to NEA Tranche Two, this will see Tranche One re-baselined.		

Benefits Realisation

Scheduled benefits realisation has yet to be finalised but is likely to be post-2021.

OPERATIONAL CAPABILITY

Progress towards Delivery of Capability and Operational Requirements

Defence Command and Control System – Progress as at 30 June 2018		
Operational Requirements	**Requirement likely to be met**	**Explanation**
Common Universal Bearer Systems wide-band satellite communications Interim Operational Capability	Yes	Delivery of strategic and ruggedised communication access nodes
Common Universal Bearer Systems wide-band satellite communications Final Operational Capability	Yes	
Mobile Tactical Command Systems Interim Operational Capability	Yes	Includes delivery of core radios, peripherals and ancillaries, developments of their network and physical integration (mounted and dismounted), including other niche radio systems.

Summary of NEA Tranche One Capability Through Life Operating Cost Estimates