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MAJOR PROJECTS REPORT

2020

MANATŪ KAUPAPA WAONGA
NEW ZEALAND MINISTRY OF DEFENCE

New Zealand Government

Front cover: top, artist's impression of the P-8A Poesidon that will be delivered under the Air Surveillance Maritime Patrol project; bottom, HMNZS *Aotearoa* arrives in New Zealand on 26 June 2020 following her delivery voyage under the Maritime Sustainment Capability project. **This page:** clockwise from left, HMNZS *Te Kaha* underway as part of Frigate Systems Upgrade sea trials off the coast of Esquimalt, British Colombia; the NH90 Flight Simulator dome in position at RNZAF Base Ōhakea; interior view of the NH90 simulator; Dive and Hydrographic Vessel, HMNZS *Manawanui*.

Other Major Projects Reports

This is the first in a new series of reports focusing on major Defence-led projects that, during a financial year, are delivering new capability approved by the Government. Earlier reports, focused on a range of projects during the financial years between 2009/10 and 2018/19, are available under the Publications section of the Ministry of Defence website.

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PROJECTS INCLUDED IN THE MAJOR PROJECTS REPORT SERIES

Project name	*Editions*
• A109 Training and Light Utility Helicopter	2010-2015
• C-130H Life Extension Project (LEP)	2010-2016
• NH90 Medium Utility Helicopter	2010-2016
• P-3K Orion Mission Systems Upgrade	2010-2015
• ANZAC Frigate Phalanx Close-in Weapon System (CWIS)	2010-2012
• ANZAC Frigate Platform Systems Upgrade (PSU)	2010-2017
• Project Protector - Multi-Role Vessel, Offshore and Inshore Patrol Vessels	2010
• Joint Command and Control System Programme (JC2S)	2010
• Defence Command and Control System (DC2S): replaced JC2S	2011-2017
• Project Protector Remediation	2011-2016
• Maritime Helicopter Capability (MHCP)	2013-2016
• Medium/Heavy Operational Vehicles (MHOV)	2013-2015
• Strategic Bearer Network (SBN)	2013-2018
• Pilot Training Capability (PTC)	2014-2016
• ANZAC Frigate Systems Upgrade (FSU)	2014-2020
• Network Enabled Army Tranche One (NEA T1 or NEA C4)	2015-2020
• Individual Weapons Replacement (IWR)	2016-2018
• Maritime Sustainment Capability (MSC)	2017-2020
• Special Operations Vehicles (SOV)	2017-2018
• Underwater Intelligence, Surveillance and Reconnaissance (UWISR)	2017-2018
• Dive Hydrographic Vessel (DHV)	2019-2020
• NH90 Simulator	2019-2020
• Air Surveillance Maritime Patrol (ASMP, FASC)	2019-2020
• Fixed High Frequency Radio Refresh (FHFRR)	2020
• Future Air Mobility Capability – Tactical (FAMC)	2020
• Operational and Regulatory Aviation Compliance Sustainment (ORACS)	2020

Previous editions of the *Major Projects Report* series from 2009/10 to 2018/19 are available on the Ministry of Defence website. www.defence.govt.nz

FROM THE SECRETARY OF DEFENCE

For over a decade the Major Projects Report has provided an overview of Defence-led projects that are being delivered as part of the Government's ongoing investment in military capability. Since 2010, the Report has given Parliament, the public, and other stakeholders visibility and scrutiny of how this investment is being managed, focusing on the three critical elements of cost, schedule and capability.

Over the period 2010 to 2018, the Office of the Auditor-General provided assurance that Defence's reporting of project performance could be read with confidence and that the information was reliable and was supported by evidence. This partnership was discontinued by the Auditor-General in 2019. However, public interest in the information made available through the Report on Defence-led projects remains high. As result, we have commissioned Audit New Zealand to undertake a separate review process that provides assurance to readers.

This change has presented an opportunity to review the format of the Major Projects Report. In discussions between the Ministry of Defence, the Office of the Auditor-General and Audit New Zealand, there is agreement that the value of the Report's information would be enhanced by its more timely delivery, ideally within six months of the end of the financial year to which it relates. The approach adopted for the 2020 Report was to align it with the publication of the Ministry of Defence's Annual Report, thereby reducing repetition of information and better streamlining the processes for preparing and reviewing the Report.

The result is a report which aims to give the reader information on the critical steps leading to the identification of the best fit option, contract execution and a decision to acquire a preferred solution. It also explains the changes, if any, to project cost estimates, timeframes, and/or requirements during the capability definition phase and prior to seeking an investment decision. In short, the critical inputs to decision-making.

Project updates as at 30 June 2020 are drawn from the Ministry of Defence Annual Report, which should be read in conjunction with this report. The updates include budget and expenditure information. At the front of the Report, a summary of project status provides an assessment of current project performance against cost, schedule, and capability.

The reporting period, 1 July 2019 to 30 June 2020, has seen good progress made in delivering defence capability. Important milestones include, but are not limited to, the:

- delivery of the new fleet tanker, HMNZS *Aotearoa*, to Devonport Naval Base;
- commencement of the infrastructure works at RNZAF Base Ōhakea for the new P-8A Poseidon maritime patrol capability;
- In-house Factory Acceptance of the NH90 Flight Training Device and the Device's delivery to RNZAF Base Ōhakea for installation; and
- commencement of Stage 2 modifications for the dive and hydrographic vessel, HMNZS *Manawanui*.

In June 2019, the Government released the Defence Capability Plan 2019. Over the twelve months covered by this report, good progress was made in implementing the Plan. This is reflected in three projects being included in the Report for the first time. These are:

- Fixed High Frequency Radio Refresh;
- Future Air Mobility Capability – Tactical; and

- Operational and Regulatory Aviation Compliance Sustainment Phase One.

These three projects, representing a combined investment of $1.6 billon, will deliver a significant uplift in new capability and in the New Zealand Defence Force's ability to operate regionally and internationally as a good neighbour and credible global partner.

This edition of the Major Projects Report highlights both the successes and challenges that were faced over the reporting period. The Covid-19 pandemic has disrupted international supply chains. Restrictions on persons entering New Zealand, and the requirement to go into isolation on arrival, have impacted our ability to access some critical technical and engineering support. Where possible, Project Teams have sought to mitigate the size of this impact, including by using in-country expertise supported remotely from overseas. Despite our best efforts, however, Covid-19 has impacted schedule delivery across a number of projects. Further details are provided in the following project pages.

Having stewardship of the Government's investment in new and upgraded Defence capability is something which the Ministry of Defence takes very seriously. It is through this stewardship that our Defence Force personnel are provided with the resources, equipment and systems that ensure they can continue to do the job New Zealanders expect of them, often under the most challenging of conditions.

The importance of the Major Projects Report is that it provides the public with an objective measure in which to assess our performance in exercising this stewardship.

Andrew Bridgman
Secretary of Defence
1 December 2020

THE MAJOR PROJECTS REPORT

This report provides information about projects led by the Ministry of Defence, which are being delivered in collaboration with the NZDF. These projects have been funded to deliver major defence capability, following approval of their business case by Government.

It is the latest in an evolving series that aims to improve the quality, transparency, and usefulness of reporting by the Ministry on the defence capability projects that are in the delivery phase in a given financial year.

Projects included in this report are assessed as being of medium or high risk, with whole of life costs greater than $25 million.

Defence-led projects in this report are at a point in their life cycle[1] where a range of activities may be underway, including:

- engaging with industry
- developing contracts for delivery of new or upgraded capability
- designing, building, developing or upgrading capability
- planning for integration of the new capability into service.

[1] See the next section, Delivering Defence Capability for more information on the Capability Management System lifecycle.

As well as providing a reference point for information on the purpose of each project, the series has created a longitudinal overview of the Ministry's performance in the management and delivery of these significant capability projects. Several projects have featured in multiple editions, reflecting the reality of a long-term lifecycle for many major Defence projects.

The Major Projects Report provides a summary of each project's history and purpose – what it has been expected to achieve, including policy objectives and capability requirements. It summarises the definition phase that led to each project's funding for delivery and outlines expenditure for each project across delivery.

A summary of performance in relation to each project's schedule, cost, and capability in the year 1 July 2019 to 30 June 2020 can be found on pages 14 and 15.

This report is designed to be read in conjunction with the Ministry of Defence Annual Report.

Projects in this edition

The *Major Projects Report 2020* focuses on nine significant projects that are delivering defence capability to the NZDF, across the services.

- Air Surveillance Maritime Patrol: delivering the fleet of P-8A Poseidon aircraft to replace the current P-3K2 Orion fleet, as well as delivering a flight training simulator, infrastructure and other elements to support the capability.
- Anzac Frigate Systems Upgrade: the latest in a programme of upgrades to extend the operational life of the two Anzac class frigates, HMNZS' *Te Kaha* and *Te Mana*.
- Dive and Hydrographic Vessel: a project that has delivered HMNZS *Manawanui*, which was commissioned on 12 June 2019. The fourth RNZN ship to sail under the name, she replaces the former hydrographic survey vessel *Resolution*, and the diving support ship *Manawanui*.

- Fixed High Frequency Radio Refresh: which is replacing the NZDF's existing high frequency radio system.
- Future Air Mobility Capability – Tactical: replacing the Royal New Zealand Air Force's tactical airlift fleet of C-130H Hercules.
- Maritime Sustainment Capability: has built and delivered HMNZS *Aotearoa*, a polar-compliant replenishment tanker that will support naval fleet and land operations.
- Network Enabled Army C4 (Tranche One): this tranche of funding delivers the first of four proposed projects under the wider Network Enabled Army programme, and is focused on delivering modern communications to land forces. C4 is the abbreviation for command, control, communications and computers.
- NH90 Simulator: a project that will increase the availability of the fleet of NH90 helicopters and crews through the installation of a flight simulator at RNZAF Base Ōhakea. This will enable initial and ongoing flight training to be conducted in New Zealand.
- Operational and Regulatory Aviation Compliance Sustainment: changes to the technological and regulatory aviation environment are being addressed by this project to ensure that the NZDF's air operations are effective, safe and secure.

Projects no longer feature in the Major Projects Report when they have finished their acquisition phase. All six projects that were included in the Major Projects Report for the year ended 30 June 2019 continue to be in their acquisition phase and feature in this edition of the report.

Previous editions

Previous editions of the Major Projects Report series from 2009/10 to 2018/19 are available on the Ministry of Defence website.
www.defence.govt.nz

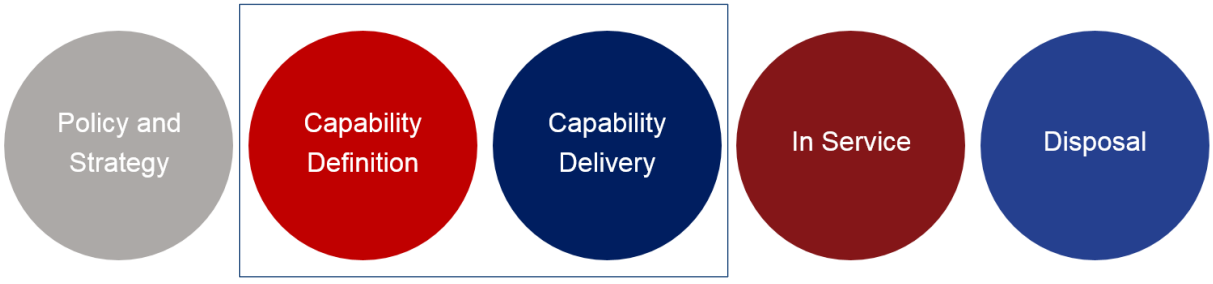
DELIVERING DEFENCE CAPABILITY

The Ministry of Defence and the New Zealand Defence Force jointly operate a contemporary and fully integrated end-to-end Capability Management System (CMS) that supports cost-effective design, delivery and maintenance, and eventual disposal of military capability.

The CMS is designed to deliver the right military capability for New Zealand at the right time, for the right price. Within it, a framework provides the guidance, standards, tools, enablers and people that are required to deliver the capability successfully.

The system has been developed specifically for the Defence context, based on an assessment of international best practice. The Secretary of Defence and the Chief of Defence Force have separate formal accountabilities for phases of the life cycle (shown below), the CMS' design reflects the requirement for close collaboration within Defence and shared accountability for the success of the system as a whole. This is demonstrated in the presence – throughout the CMS' governance arrangements, management processes and framework – of people from both the Ministry and the NZDF.

For each project that was in the delivery phase of its lifecycle during the 2019/20 financial year, this report outlines key information about the programme of work, particularly the work undertaken during its definition phase.



As Defence-led projects, teams are established to define, develop and deliver the capability.

These teams are comprised of personnel from both the Ministry and NZDF, and include policy and project specialists, and subject matter experts, reflecting the technical and business functions required.

Since 2017 Integrated Project Teams (IPTs) have been established for most major capability projects currently in delivery.

Six of the 9 projects in this report are being delivered by IPTs: Air Surveillance Maritime Patrol, Anzac Frigate Systems Upgrade, Dive and Hydrographic Vessel, Future Air Mobility Capability Tactical, Maritime Sustainment Capability, and Network Enabled Army C4.

The Fixed High Frequency Radio Refresh, NH90 Simulator, and Operational and Regulatory Aviation Compliance Sustainment projects are being delivered by teams led by project managers or acquisition leads.

Within the context of Government policy and strategy, in this phase the Ministry and Defence Force work together to define the future capabilities that are needed. Business cases are prepared to enable Government to make investment decisions. Using the Government's Better Business Case model, projects progress through the stages of the investment process, supported at each stage as required by these business cases:

- Initial thinking in the **indicative business case**
- A decision to go to market through the **detailed business case** or **single stage business case**
- The final decision on the capability through the **project implementation business case**.

Brief explanations of these terms can be found at the end of this report.

The Capability Delivery Phase seeks proposals to deliver the capability required by Government, and has been designed to deliver a solution that achieves the required outcomes and benefits. The process spans the planning to source and integrate new capability, gaining approval to commit to and execute a contract, managing the capability integration process, acquiring and accepting the deliverables, and the interim operational release of the new capability before the transition to operational release and being in service.

CONTINUOUS IMPROVEMENT IN PERFORMANCE

Defence's major projects have been considered in this report across three metrics: schedule, budget and capability. 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 metrics hold 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 schedule may face pressure if contractual timeframes are not met at any point during the project. 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 occurs. Where possible, options such as buying capability "off the shelf" and minimising, where possible, the need to undertake configuration changes. This reflects and is consistent with comments that focused on improving Defence's project management, which were made by the Controller and Auditor-General in 2010 – the year in which the first Major Projects Report was published.

For complex projects, "off the shelf" solutions may not be possible, but where a supplier has proven experience in delivering a solution, that experience may help in planning and delivering to the standard sought across all three metrics.

Investment in Budget 2015 increased the Ministry's operating funding by $27.1 million over four years, enabling the Ministry to implement a significant change programme, which has delivered improvements across the joint Capability Management System. A review undertaken by Sir Brian Roche KNZM in 2018 reinforced this. In the *Review of Defence Procurement Policies and Practices for Major Capability Projects*, it was concluded that the change programme 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"*.

INDEPENDENT REVIEW REPORT

AUDIT NEW ZEALAND
Mana Arotake Aotearoa

INDEPENDENT REVIEW REPORT TO THE READERS OF THE MINISTRY OF DEFENCE'S MAJOR PROJECTS REPORT FOR THE YEAR ENDED 30 JUNE 2020

We have carried out a review of the project status reports included in the *Major Projects Report 2020* prepared by the Ministry of 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 the Ministry of Defence are not fairly disclosed.

We have used our staff and resources to carry out the review.

The project status reports on pages 12 to 90 cover the following acquisition projects:

- Air Surveillance Maritime Patrol;
- ANZAC Frigate Systems Upgrade;
- Dive and Hydrographic Vessel;
- Future Air Mobility Capability;
- Maritime Sustainment Capability;
- Network Enabled Army C4 (Tranche One);
- NH90 Simulator;
- Operational and Regulatory Aviation Compliance Sustainment.

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

Review work carried out

The review was carried out under section 17 of the Public Audit Act 2002 and 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:

A business unit of the Controller and Auditor-General | www.auditnz.parliament.nz

- reconciling the non-financial information in the project status reports to supporting documentation provided by the Ministry of Defence;
- reconciling financial information in the project status reports to the Ministry of Defence's audited financial statements for the year ended 30 June 2020;
- seeking explanations from the Ministry of Defence staff for any questions arising from the reconciliations; and
- considering the effect of events subsequent to 30 June 2020 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 the Ministry of Defence

The Secretary of Defence is responsible for preparing the *Major Projects Report 2020* to fairly disclose information about the specified acquisition projects. It is therefore his 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 2020;
- financial performance against the budgets approved by Cabinet;
- expected achievements;
- planned time frames; 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.

Audit New Zealand's responsibility

Our responsibility was 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*.

Audit New Zealand is independent of the Ministry of Defence. Audit New Zealand also performs functions and exercises powers under the Public Audit Act 2001 as the auditor of the Ministry of Defence on behalf of the Auditor-General. Other than the audit of the Ministry of Defence, Audit New Zealand has no relationship with, or interests in, the Ministry of Defence.

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 2020* have not been fairly disclosed.

Lyn Daken
Associate Director, Specialist Audit and Assurance Services
Audit New Zealand

1 December 2020

MAJOR PROJECTS IN DELIVERY

2019/2020

MANATŪ KAUPAPA WAONGA
NEW ZEALAND MINISTRY OF DEFENCE

STATUS OF PROJECTS

The project summaries contained in this part of the Major Projects Report provide a concise, simple and high level overview of each project. The summaries include a description of each project's policy objectives and capability requirements, recent developments, and financial reporting for the 2019/20 year.

Performance at 30 June 2020

Throughout all phases of a project, Defence's approach 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. In any given year projects will encounter the effects of issues and risks – some of which are anticipated, and some that are not.

Schedule

The rapid onset of the COVID-19 pandemic, and the necessary global response as the world attempted to control the spread of this virus impacted the progress of delivery of some projects in particular.

While capability and overall benefits are expected to be realised, along with delays, there may be additional cost incurred and – as the pandemic continues – this is not yet able to be determined with certainty.

Projects that reported baseline schedule delays at the end of the financial year were the Anzac Frigate Systems Upgrade (FSU), Dive and Hydrographic Vessel, and NH90 Simulator projects. New schedule dates were approved by the Minister of Defence in August 2020.

Other projects reported minor delay from COVID-19, but these were not expected to affect the baseline schedule. These projects are Air Surveillance Maritime Patrol, Maritime Sustainment Capability, Fixed High Frequency Radio Refresh, and Network Enabled Army Tranche One.

Cost

All projects expected to remain within appropriation with Air Surveillance Maritime Patrol and Maritime Sustainment Capability expecting some use of contingency.

Capability

All projects continue to expect to achieve delivery of the agreed capability.

Key

	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.

Summary of project status at 30 June 2020

This table summarises the projects' status for baseline cost, schedule, and capability to be delivered.

Project	Cost		Schedule		Capability	
Air Surveillance Maritime Patrol	G	Project remains within appropriation; proposed call on contingency.	G	While COVID-19 had some minor impact on the schedule, the project's IOR and Operational Release dates are not at risk.	G	No change to the capability that will be delivered.
Anzac Frigate Systems Upgrade	G	Project remains within appropriation.	R	The 39 month cumulative delay reported in the 2018 and 2019 editions was expected to increase as a result of the impact of COVID-19 restrictions. The extent of the delay had not been determined.	G	No change to the capability that will be delivered.
Dive and Hydrographic Vessel	G	The project remained within appropriation.	R	COVID-19 restrictions impacted some modifications, with suppliers' technicians unable to travel during the pandemic. The project expects to meet commitments during the year.	G	No change to the capability that will be delivered.
Fixed High Frequency Radio Refresh	G	The project is expecting to remain within appropriation.	Y	COVID-19 has impacted the delivery schedule. However, it is not anticipated that this delay will impact the final delivery into service or operational release of the capability.	G	No change to the capability that will be delivered.
Future Air Mobility Capability - Tactical	G	The project remained within appropriation.	G	All deadlines were met. The schedule was re-baselined following the Cabinet decision on the Project Implementation Business Case.	G	No change to the capability that will be delivered.

Project	Cost	Schedule	Capability
Maritime Sustainment Capability	G Project expects to remain within approved budget, with use of baseline contingency.	Y The project reported that operational release may take place in Q1 2022, which is two months behind the original date. The impact of COVID-19 is under review.	G No change to the capability that will be delivered.
Network Enabled Army Tranche One	G Project expects to remain within appropriation.	Y The Tranche one critical path remains unaffected, however some non critical capabilities are experiencing delays due to COVID-19.	G No change to the capability that will be delivered.
NH90 Simulator	G Project expects to remain within appropriation.	R Baseline schedule delay experienced due to delay in achieving In House Acceptance Testing, and the effects of COVID-19.	G No change to the capability that will be delivered.
Operational and Regulatory Aviation Compliance Sustainment	G The project remains within appropriation.	G The project expects to meet projected delivery dates.	G No changes to the capability as signed off in the Business Case

AIR SURVEILLANCE MARITIME PATROL

In July 2018 the Government decided to acquire four P-8A Poseidon aircraft, replacing the New Zealand Defence Force's P-3K2 Orion aircraft, which need to be retired by 2025. The new fleet will be capable of delivering the maritime patrol function for the next generation. The project will also deliver the infrastructure and training support needed for the new capability.

The P-3K2 Orion fleet, New Zealand's maritime patrol aircraft, have played a significant role in promoting security for more than 50 years, patrolling the ocean to protect New Zealand's sovereignty, trade routes and the international rules-based order. They have also supported search and rescue, resource and border protection, disaster response and engagement with our key security partners.

Government policy has stressed the importance of maritime patrol over many decades. In April 2017 Cabinet noted the policy value of New Zealand's MPAs, and most recently the *Strategic Defence Policy Statement 2018* stated that they:

- provide a key maritime combat capability that can also support other government agencies on a range of domestic contingencies;
- enable the Government to offer a highly valued capability to international coalition operations; and
- provide a wide area surveillance capability that is critical to maintaining awareness of activities in New Zealand's maritime domain.

THE PURPOSE OF THIS PROJECT

The project was initiated to identify capability and user requirements for a replacement to the current maritime patrol aircraft capability. Options for the type and number of aircraft that would be required to support Government policy would be explored, and recommendations for replacements would be made along with any recommendations relating to infrastructure, training and support requirements.

Following the Government's decision in 2018, the project is delivering four P-8 Poseidon aircraft to replace the P-3K2 Orion fleet, a flight

P-8A Poseidon (artist's impression)

training simulator, and infrastructure at RNZAF Base Ōhakea, where the new capability will be based.

The infrastructure component of the project includes an aircraft hangar, squadron headquarters, and operations centre. Airfield works include runway and taxiway strengthening, lighting for maintenance operations at night, the apron where the aircraft will be parked, and an aircraft rinse facility.

The Air Surveillance Maritime Patrol (ASMP) project was part of a wider scope of work, initiated in 2015 under the name Future Air Surveillance Capability. The scope initially included exploring options for a complementary capability to support the work of other government agencies, such as search and rescue or fisheries surveillance. The decision was made to investigate options for delivering the support for this civilian capability under a separate project, the Enhanced Maritime Awareness Capability Project. During the 2019/20 financial year, that project was not in its delivery phase and so does not feature in this edition of the *Major Projects Report*.

CAPABILITY REQUIREMENTS

Capability requirements identified as necessary to support policy objectives are:

The ability to multi-task: New Zealand has a small air force by international standards and therefore its assets are required to perform multiple roles.

Community size/close relationship with user community: Being part of a group of partner countries with the same platform provides access to critical mission and logistics support in different locations. It was considered best for New Zealand to participate in as large a user community as possible, with as many friends as possible, for support.

Already developed: Maritime patrol is a sophisticated technology that requires significant research and development investment to achieve. It was therefore considered that New Zealand should look to identify a capability which had already been developed and worked from the get-go.

Successful introduction into foreign markets: Maritime patrol involves complex systems which tend to be more demanding to keep operational than basic ones. It was therefore considered best for New Zealand to go with a proven capability.

Support for technology growth path: The *Strategic Defence Policy Statement 2018* stated, *"As partners acquire ever-more sophisticated capabilities, contributing to coalition operations will require high-level network interoperability and contributions that do not present a defensive liability to them… To retain New Zealand's reputation, freedom to act, and mitigate risks to mission and personnel, Defence must strive to keep pace with technological evolutions"*.

In the context of maritime patrol technology rapidly advancing, and becoming increasingly IT-based and therefore requiring regular upgrades, it was considered that New Zealand should look to a platform which will be fully supported through the upgrade path and where upgrade costs could be shared with other users.

THE BUSINESS CASE PROCESS

Prior to the approval of an Indicative Business Case for the project, Boeing and the United States Government advised that the last chance for New Zealand to secure the price benefits of being part of the large US purchase was June 2017. This was subsequently extended, at New Zealand's request, to 30 November 2017, and then 14 July 2018. In relation to the 14 July 2018 deadline Boeing and the US Government advised that if New Zealand delayed beyond that date, price increases were expected.

It was therefore necessary to accelerate consideration of the P-8A to preserve that option for the Government.

In December 2016 Cabinet invited the Minister of Defence to report back in June 2017 with an Implementation Business Case on which Ministers could make a decision on whether to conclude a US Foreign Military Sales Letter of

Acceptance (see page 20 for more details) for the P-8A. The business case took the approach of considering whether an alternative to the P-8A would be available in the same timeframe if Cabinet decided to not acquire that type of aircraft.

Information used to inform the business case on alternatives was from open source, or was provided by companies in response to a Request for Information. Information on the P-8A was sourced from the Letter of Offer provided by the United States Government.

On assessing that there was no better alternative to the P-8A (one that would meet all of New Zealand's requirements), a full Implementation Business Case recommending the acquisition of the P-8A was developed for the Government's consideration.

Groundworks at RNZAF Base Ōhakea as part of the infrastructure development to support the new P-8A fleet.

Better Business Case Milestones History

2016	
29 February	**Strategic Assessment** approved by Vice Chief of Defence Force and Deputy Secretary (Policy)
7 December	Cabinet **authorised** New Zealand to issue a Letter of Request to the US Government for detailed cost and availability information for the P-8A; and **Invited** the Minister of Defence to report back in June 2017 with an Implementation Business Case on which Ministers could make a decision on whether to conclude the Letter of Acceptance for the P-8A. EGI-16-MIN-0338
2017	
7 April	Cabinet noted the **Policy Value of New Zealand's Maritime Patrol Aircraft** CAB-17-MIN-0137
2018	
2 July	Cabinet agreed to recommendations as outlined in the **Implementation Business Case** for the order of four Boeing P-8A Poseidon maritime patrol aircraft, training systems and other support equipment and services through the US FMS process, and acquisition of infrastructure and other components as required to bring the P-8As into service. CAB-18-MIN-0305

CAPABILITY DEFINITION PHASE

From the approval of the Project Charter in March 2015, it was 40 months until the Implementation Business Case was approved

by Cabinet in July 2018. During this time a range of work was undertaken by the project.

How Defence identified and assessed operational requirements

Key user requirements

In addition to the capability requirements outlined on page 17, the following key user requirements were developed following consultation across NZDF and the Ministry of Defence in March and July 2017:

Operate: The user shall be able to conduct missions worldwide as directed.

Process and Exploit: The user shall be able to process and exploit all data collected by the MPA.

Interoperability: The user shall have the capability to interoperate with organisations, platforms, systems and applications in a manner necessary to fully utilise the MPA.

Communicate: The user shall have the means with which to receive and disseminate information and intelligence to military and other government agencies, platforms, systems and applications.

'Find, Fix, Track, Target, Engage and Assess' for Anti-Submarine Warfare (ASW): The user shall be able to conduct effective and persistent ASW.

'Find, Fix, Track, Target, Engage and Assess' for Anti-Surface Warfare (ASuW): The user shall be able to conduct effective and persistent ASuW.

Support Search & Rescue and Surveillance of South Pacific and Southern Ocean: The user shall be able to conduct search and rescue including the ability to deploy survival equipment in the New Zealand and Fiji Search and Rescue Regions (Maritime). The user shall be able to conduct surveillance operations in the regions of the South Pacific and Southern Ocean of interest to New Zealand. The user shall be able to conduct maritime reconnaissance operations for vessels of interest within the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR, April 1982) areas of interest to New Zealand.

Defend from Threats: The user shall be able to defend themselves from threats to the capability.

Support the capability: The user shall have the capability to support the MPA.

How Defence analysed options in the Capability Definition phase

The project team considered each maritime patrol aircraft option available in the market and the indicative costs for each, which were derived from the Request for Information data, and the US Letter of Offer for the P-8A.

It was assessed that a number of a smaller class of maritime patrol aircraft in the market had insufficient range for New Zealand's vast ocean region and would not meet New Zealand's demanding requirements. There were also satellites and remotely piloted aircraft systems, which offered the potential to assist with some lower order, civilian surveillance tasks, but which could not perform the full range of functions.

It was assessed that only large, manned aircraft, like the P-3 Orion, had the full package of speed, endurance and sophisticated military functions necessary. That market was limited to three options:

- **US Boeing P-8A Poseidon** – the US investment in a replacement for its Orion fleet.
- **Japanese Kawasaki P-1** – Japan's investment in a replacement for its Orion fleet.
- **A concept aircraft**, exemplified by the Lockheed Martin "Sea Hercules" - a design proposal based on the well-known military transport aircraft.

How Defence considered interoperability

Interoperability was one of the key considerations of the ASMP project, as reflected in the third key user requirement, and the capability requirement for the MPA replacement to have a large community size to allow access

to critical mission and logistics support in different locations (also noted above).

How Defence considered through-life costs and issues

Maintaining the capability throughout its life will require ongoing upgrades, replacement and planning for obsolescence. An ongoing and planned schedule of upgrades is the preferred approach, rather than major injections of capital funding, as and when obsolescence becomes a pressing requirement.

In general, the ASMP project is replacing the existing maritime patrol aircraft with a contemporary version. In considering the available options it was recognised that one way to reduce through-life risks was to share these with other users. It was known that the P-8A was also being acquired by Australia, the United Kingdom, the United States and Norway, and that operating the same capability as used by allies and partners has advantages. These include leveraging the economies of scale of being part of a much larger fleet, including sharing costs for through-life support and non-recurring engineering costs for upgrades. Without a wide pool of operators to share development costs, New Zealand would need to fund a higher proportion of such costs; what this would amount to would depend on the number of other users of the capability, and whether they would be willing to enter into a shared costs approach.

Estimates for through-life capital sustainment and operating costs were considered, including hardware and software refreshes, major aircraft and engine restoration and overhauls, and personnel costs for operating, maintaining and sustaining the proposed delivery of outputs from the P-8A capability.

Requirements Analysis

The P-8A was the only capability of the three options that met all of the criteria. It was also the lowest capital cost and lowest risk option.

ACQUISITION PHASE

How Defence decided to acquire the Capability Solution

Procurement of the P-8A capability was only possible from the United States Government via the Foreign Military Sales (FMS) process. FMS is a programme that allows our government to purchase defence articles and services, as well as design and construction services, from the US Government, on a “no-profit” and “no loss” basis to that government.

Following approval from Cabinet in December 2016, Defence issued a formal Letter of Request to the US Government for supply of the P-8A and associated systems.

The final Letter of Offer was issued from the US Government on 1 June 2018. Following Cabinet approval, the Letter of Offer was accepted by the Secretary of Defence on 9 July 2018.

Contract Status at 30 June 2020

MPA: P-8A	The Government of the United States of America, via Foreign Military Sales
Infrastructure: Horizontal Works	Fulton Hogan
Infrastructure: Vertical Works	Tenders were being assessed at 30 June 2020.

SCHEDULE/TIMEFRAME PROGRESS

Schedule of Capability Integration – P-8A fleet

	Initial Estimate	30 June 2020 (Forecast/Actual)	Variance (months)
Delivery of first P-8A to NZ	April 2023	April 2023 (Forecast)	N/A
Initial Operational Release 1	July 2023	July 2023 (Forecast)	N/A
Operational Release; available for overseas deployment	2025	2025 (Forecast)	N/A

ASMP CAPABILITY INTEGRATION

The first Capability Integration Plan was released for review mid-2017 and approved in June 2018. The plan is developed as a living document to ensure the full benefits of the P8A capability are realised by the NZDF. It identifies major areas of planning and coordination that are required to deliver all elements of the capability, ensuring operational release takes place. Activities within the Capability Integration Plan include:

Infrastructure: construction of new squadron headquarters and facilities to house aircrew, mission support and maintenance personnel, hangar facilities and the operational apron area in front of the hangar for four P-8A aircraft at RNZAF Base Ōhakea.

Mission Support: ensuring the ground functions required to plan a mission are in place.

Training: aircrew, mission support personnel and maintenance staff will be qualified to operate, support and maintain the P-8A aircraft with training from US Navy and contractor instructors.

Airworthiness: there are required certification activities that will ensure the RNZAF can safely operate and maintain the P-8A capability, and meet safety and legislative obligations. These activities relate to design acceptance of the aircraft and simulators (technical airworthiness), and organisational approvals to ensure the RNZAF can safely operate the aircraft in a mission environment (operational airworthiness). These approvals come from the NZDF Airworthiness Authority.

DURING THE 2019/20 YEAR

Horizontal infrastructure works began at the end of November 2019 with a site blessing and ground breaking event at Ōhakea. Fulton Hogan was awarded the contract for these works, which includes construction of airside apron pavements and services, as well as landside civil infrastructure, following a tender process held in the first half of the financial year.

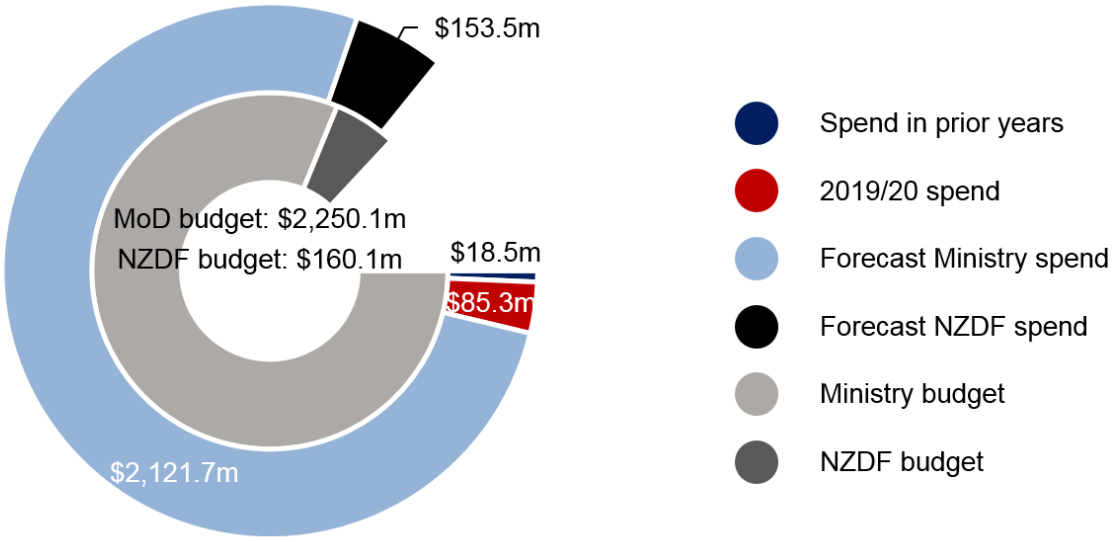
In September 2019 industry were invited to register interest in the project's vertical works, comprised of buildings and building foundations needed to support the capability at Ōhakea. With security clearance requirements for this component of the project, a shortlist of qualifying providers were invited to submit a tender in the first half of 2020, with the deadline for submissions extended following the declaration of Alert Level 4.

The impact of COVID-19

No specific impact on the delivery of the project's Foreign Military Sales components were identified as at 30 June 2020.

Horizontal works at Base Ōhakea ceased during New Zealand's lockdown period and restarted when the country moved to Level 3. While the project has extended the vertical works tender period, any adjustments to the project's infrastructure schedule is not expected to affect delivery of the project's overall benefits.

ASMP PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Air Surveillance Maritime Patrol project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	2,250,051	160,087	2,410,138
	Allowance for foreign exchange movements	125,140	-	125,140
	Original approved project budget	2,124,911	160,087	2,284,998
Forecast	Forecast total project cost	2,225,482	153,457	2,378,939
	Effect of foreign exchange movements	100,624	-	100,624
	Forecast cost using hedged rate	2,124,859	153,457	2,278,316
	Forecast project variance	52	6,630	6,682

DEVELOPMENTS POST 30 JUNE 2020

Horizontal works at Ōhakea continued with completion of the main building platform compaction, and taxiway upgrade groundworks began and were completed in preparation for handover of the site for the start of vertical works once a contract has been signed.

The instructor crew, who have been training in the United States graduated onto the P-8A in September and will complete their consolidation flying before completed instructor training.

ANZAC FRIGATE SYSTEMS UPGRADE

This upgrade is restoring the frigates' ability to fulfil combat roles and provide high quality surveillance in the contemporary and emerging security environment. This will ensure that the Government retains the ability to deploy HMNZS Te *Kaha* and *Te Mana* 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 frigates were over 10 years old and that many of the surveillance and combat systems were 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 reduction in capability that has continued to occur.

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
- 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[2] 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:

- **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.

[2] Since publication of the *Defence White Paper 2010*, changes to the project's schedule have seen the completion date updated (see page 31, Schedule of Capability Integration).

- **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 of a platform that can complete a mission throughout its remaining life.

FSU Better Business Case Milestones

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

CAPABILITY DEFINITION PHASE

A total of 44 months' work was undertaken during the project's definition phase, from June 2007 to February 2009, at which point work was suspended pending the outcome of the *Defence White Paper*. Following publication of that document, work recommenced in November 2010 and was concluded two years later (November 2012) when the Detailed Business Case (DBC) was approved.

How Defence identified and assessed capability and operational requirements

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

A number of mission systems were identified as facing 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 a key consideration 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. However new technologies are being introduced as well, 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.
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 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	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 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

in order to enable completion of a mission throughout the life of the platform.	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.	

History of Cost Estimates in the Capability Definition Phase

	2004	2008	2012
Costs (NZ$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.		

Estimated Acceptance Date in the Capability Definition Phase

Early estimates of an acceptance date, prior to the suspension of work on the project ahead of the *Defence White Paper*, was circa 2010.

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:

- Issue Requests for Tender for the lead contractor, supply of components and other

items as required to deliver the capability level; and

- 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 at 30 June 2020

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 responses where they differed.

SCHEDULE/TIMEFRAME PROGRESS

Variations in forecast acceptance date

	Original Forecast at Approval to Commit	30 June 2020 Forecast/Actual	Variation (months)
Acceptance: Ship One	March 2017	September 2020 (Forecast)	42
Acceptance: Ship Two	February 2018	May 2021 (Forecast)	39

Comment: Initial schedule estimates were made at the time the Project Implementation Business Case was submitted. At the time the contract was awarded, dates were firmed up as much as possible prior to completion of preliminary and detailed designs. Following completion of the detailed design phase, in December 2017 approval for additional funding and a re-baselining of the schedule was received from Cabinet.

The June 2020 Forecast reflects that 2017 re-baselined schedule, including the revised installation start dates of May 2018 for Ship 1 (*Te Kaha*), and May 2019 for Ship 2 (*Te Mana*), both of which were achieved. It also reflects the revised schedule for *Te Kaha* provided by Lockheed Martin Canada in March 2019. Due to delays in the industrial phase work for *Te Kaha*, an Acceptance date of 10 September 2020 was advised by Lockheed Martin Canada. There was no change to *Te Mana's* Acceptance date. However at 30 June, the impact of COVID-19 on the schedule had not been determined and was being assessed. Some delay was expected.

History of variations to schedule

2017	
6 December	Ship One: 38 months. 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.
	Ship Two: 39 months. As with Ship One, the new acceptance date was set as a result of the project's schedule re-baselining.
2019	
March	Ship one: 42 months total. Due to delays with the industrial phase work for Te Kaha, a revised Acceptance date was provided by Lockheed Martin Canada.

FSU CAPABILITY INTEGRATION

Description of Capability Integration

An Introduction into Service Plan was developed to coordinate the test and evaluation processes required to bring the upgraded frigates back into operational service with the following main activities:

Engineering change process: The overarching framework 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.

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.

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 Capability Integration

Unless stated, all dates are for Ship 1: *Te Kaha*.

	Initial Estimate (2014)	At 30 June 2020 (Forecast/Actual)	Variance (Months)
Platform accepted by Crown	Ship 1: March 2017 Ship 2: February 2018	Ship 1: *Te Kaha* September 2020 (Forecast) Ship 2: *Te Mana* May 2021 (Forecast)	42 39
Initial Operational Capability	May 2017	September 2020 (Forecast)	40
Operational Test and Evaluation (OT&E) begins	May 2017	May 2021 (Forecast)	48
OT&E ends	February 2018	July 2022 (Forecast)	53
Operational Release	TBC	July 2022 (Forecast)	-

Explanation: A contract change proposal for the installation phase was signed with Lockheed Martin Canada in December 2017 following Cabinet approval of additional funding when the project schedule was re-baselined as well. In March 2019 Lockheed Martin Canada advised the Crown of a delay to *Te Kaha's* acceptance date. Since December 2017 further planning and analysis of the scope and scale of the OT&E, including alignment with international exercises required for OT&E, and ship maintenance activities delayed due to the upgrade programme resulted in a revised date of July 2022 both for the end of OT&E and for achieving Operational Release.

FSU OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements

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

Operational Requirements	Requirement likely to be met
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.
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 2022.	

DURING THE 2019/20 YEAR

At the start of the year both masts of *Te Mana* were removed and fabrication of the replacement masts had begun. The frigate's old equipment was removed ahead of the start of the work programme to install new cabling, equipment and systems. By the end of the financial year all new equipment was in place including the new masts, and the significant task of connecting cables and systems was underway.

In November 2019 the Crown took custody of *Te Kaha*. The ship was moved from Victoria Shipyards Ltd (VSL) to the Canadian Forces Base's Fleet Maintenance Facility at Cape Breton. Reactivation and set to work activities began in relation to legacy and combat systems ahead of *Te Kaha* undergoing her Sea Trials programme from September 2020.

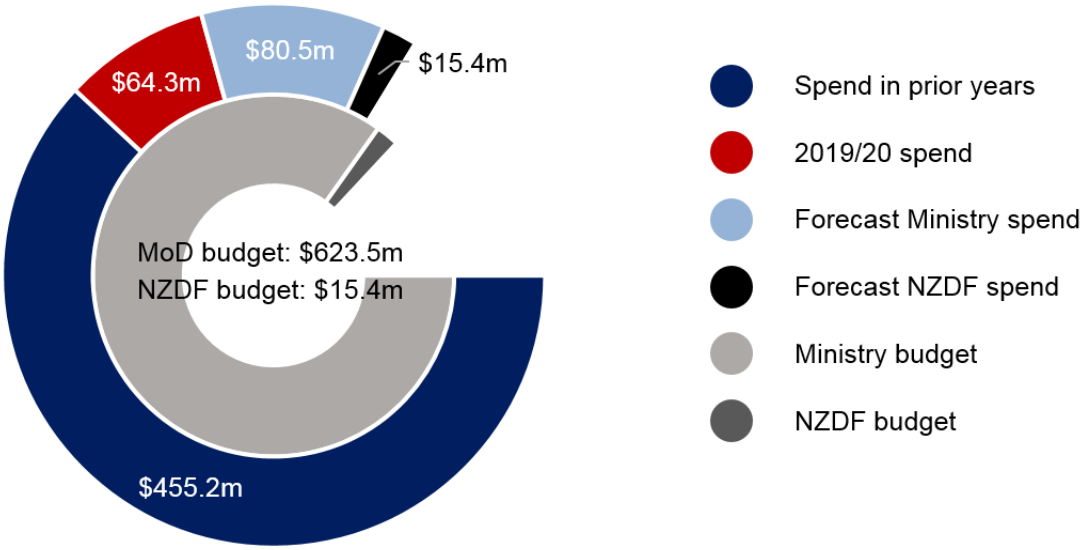
The impact of COVID-19

The VSL and Fleet Maintenance Facility operations were affected by operating restrictions as a result of the pandemic. A number of the crew of *Te Kaha* were repatriated to New Zealand in March 2020 as work was scaled back, however they were able to return from June 2020 to support the trials programme.

As VSL's facility remained operational through the emergence of the pandemic, and the upgrade of *Te Mana* continued, although at reduced efficiency.

HMNZS Te Kaha *heads out to sea off the coast of Esquimalt, British Colombia, ahead of the start of sea trials, September 2020.*

FSU PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Anzac Frigate Systems Upgrade project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	623,537	15,408	638,945
	Allowance for foreign exchange movements	44,752	-	44,752
	Original approved project budget	578,785	15,408	594,193
Forecast	Forecast total project cost	599,991	15,408	615,399
	Effect of foreign exchange movements	21,449	-	21,449
	Forecast cost using hedged rate	578,542	15,408	593,950
	Forecast project variance	243	-	243

DEVELOPMENTS POST 30 JUNE 2020

Navy personnel returned to Canada for the preparation for sea acceptance trials and set to work, including further training. The Maritime Operational and Evaluation Team also travelled to Canada and completed an assessment of the ship's crew; a pre-requisite for sea trials to commence.

The sea trials for *Te Kaha* commenced on 14 September 2020 and were completed by the end of October. Minor work identified during sea trials was completed in November.

Work to quantify the effects of the COVID-19 pandemic resulted in agreement to adjust the schedule for acceptance of *Te Kaha*, which took place on 27 November 2020, two months later than scheduled. Ship acceptance of *Te Mana* was re-scheduled from mid-2021 to the fourth quarter of that year.

DIVE AND HYDROGRAPHIC VESSEL

This project has been responsible for the purchase and modification of a hydrographic and deep diving support capability. It has resulted in the purchase, modification and commissioning of the fourth vessel to sail with the Royal New Zealand Navy under the name HMNZS *Manawanui*.

THE PURPOSE OF THIS PROJECT

The Dive and Hydrographic Vessel (DHV) project was set up to acquire replacement capability for the Royal New Zealand Navy's diving support and hydrographic functions.

The hydrographic survey vessel *Resolution* retired in 2012 and the diving support vessel *Manawanui* was decommissioned in 2018. The replacement vessel was sought to deliver the capability to conduct a range of operational and military tasking including hydrography (mapping of the littoral surface and subsurface environment), deep diving[4] operations and other specialist tasks, including support to the New Zealand Police and other government agencies.

THE ORIGINS OF THIS PROJECT

The DHV project's origins are linked with those of an earlier project, the Littoral Operations Support Capability (LOSC). Initiated in 2013, LOSC was set up to identify options to ensure the NZDF had equipment to support and enable its operations in the littoral environment and to replace *Manawanui* and *Resolution*, the vessels that were – at the time – supporting the Navy's hydrographic, mine countermeasures and diving capabilities.

The project was initiated in August 2013 and, over the 52-month period that it was active, the team explored options for replacing the two vessels. Information developed as part of LOSC was used to inform recommendations and decisions made in relation to DHV. That work is outlined here to provide background.

The LOSC project team's work included seeking information from industry, developing documentation to support the project, and business case development:

- In October 2013 a request for information (RFI) sought to develop an initial set of user requirements with a target delivery date of mid-2017.
- In November 2014 the Secretary of Defence and Chief of Defence Force approved the project charter.
- In April 2015, Cabinet agreed that two options from the LOSC Indicative Business Case were to be taken forward for consideration during the *Defence White Paper 2016* process: a dive and hydrographic tender that would offer the baseline level of capability; and the enhanced capability of a Littoral Operations Vessel.
- In June 2015 a further RFI released to the market included a refined statement of user requirements, updated project schedule and contract delivery date, enabling Defence to assess the commercial information it was holding, given changes in the ship design and construction market, and the global economy at the time. This information was used to inform the development of the Detailed Business Case.
- In July 2016, Cabinet considered the Detailed Business Case and agreed that a Littoral Operations Vessel was the preferred solution, authorising the Secretary of Defence to undertake a competitive tender,

[4] Deep diving refers to dive operations approximately 30m below the surface, used in salvage, ship repair, search and recovery, and underwater clearance.

which was released in September 2016. The request for tender sought a ship suitable for supporting littoral operations, along with a range of documentation, manuals and data, training, spares, support and test equipment. It closed at the end of November that year and an assessment and evaluation process was undertaken of the tenders received.

- By April 2017 costs had been assessed and due diligence activities undertaken to refine costs. During this time options were considered for addressing a funding shortfall within the wider Defence portfolio and. LOSC was identified as part of an option for addressing the shortfall, which would reduce the project's funding and scope.

At the end of 2017, Cabinet reprioritised $148 million from LOSC to the Frigate Systems Upgrade project and directed Defence to report back with costed options for a Dive and Hydrographic Vessel.

LOSC Better Business Case Milestones

2014	
13 November	**Project charter** approved by Secretary of Defence and Chief of Defence Force
2015	
10 April	Cabinet agreed that two options from the **Indicative Business Case** be taken forward for further consideration – a Dive Hydrographic Tender and a Littoral Operations Vessel. CAB Min (15) 11/7
2016	
4 July	Cabinet agreed a Littoral Operations Vessel was the preferred solution in the **Detailed Business Case** and authorised the Secretary of Defence to undertake a competitive tender. CAB-16-MIN-0313
2017	
11 December	**Change of Scope** Cabinet reprioritised $148 million of funding to the Frigate Systems Upgrade project, reducing this project's scope from a Littoral Operations Vessel to a Dive and Hydrographic Vessel. CAB-17-MIN-0539

DHV Better Business Case Milestones

2018	
18 June	Cabinet agreed the **Single Stage Business Case** recommendation to purchase and modify a second-hand commercial offshore support vessel to provide continued support for the NZDF's dive and hydrographic capabilities. Cabinet delegated to Joint Ministers (Finance and Defence) authority to commit funds for the

	purchase, modification, and entry into service of the Dive and Hydrographic Vessel. CAB-18-MIN-0281
19 August	Ministers of Finance and Defence agreed to the procurement and modification of a Dive and Hydrographic Vessel, as recommended in the **Project Implementation Business Case**.

As a result of the change of scope, the LOSC project team was refocused to source a dive and hydrographic vessel.

THE DHV PROJECT

Overarching benefits that were identified in relation to a Dive and Hydrographic Vessel are:

- Underwater operational competencies are generated and maintained (including the achievement of diving and hydrography seaworthiness, surface supplied breathing apparatus diving, and multi-beam echo sounder).
- The NZDF has the capacity and capability to support domestic operations, including deep diving and hydrography capabilities.
- Regional partners are supported in specialised areas, with improved options for the Government to provide underwater support.

CAPABILITY REQUIREMENTS

Capability requirements that were included in the scope of the DHV project are:

- deep diving
- ship-based military hydrography, including large-area hydrographic survey and precise and accurate data gathering adverse weather conditions
- mine countermeasures
- search and rescue and
- support to other Government agencies.

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

With the project scope refocused in the last quarter of 2017, work began on identifying suitable vessels that could meet Defence Force dive and hydrographic capability requirements.

A range of capability and operational requirements identified within the broader LOSC project's scope remained valid under the reduced scope of the DHV project, including:

- dynamic positioning to support use of remotely operated vehicles
- engines that are able to operate a low speed for extended periods of time to support hydrographic surveying
- a ship's crane designed for larger load lifts and operating on a platform that is fixed in location by either multiple ship's anchors (four point mooring) or a dynamic positioning system
- deep diving below 30m which is required by New Zealand law to be undertaken from a vessel that has a precise-position-keeping system, as well as with hyperbaric support on site to provide divers with a safe environment in which to recover.

In sourcing a vessel from the commercial market, it was noted that capabilities delivered and supported by the NZDF's former dive ship and hydrographic vessel would be available in an existing offshore support vessel designed to support offshore oil and gas activities.

How Defence analysed the requirements options in the Capability Definition phase

The project considered three options for acquiring a suitable vessel; commissioning a new build, leasing and modifying a vessel, and buying and modifying a second-hand vessel.

A range of available ships was assessed against requirements (eg speed, deck area, build quality, accommodation, suitability for conversion to a military vessel, and price). Another key consideration was seakeeping and

stability. Seakeeping refers to a vessel's motion responses to various sea conditions and is generally expressed in terms of crew comfort and workability, potential for damage to cargo and structure, and equipment/system availability.

An evaluation of shortlisted ships was conducted in early 2018 to evaluate the condition of the vessels and evaluate their suitability for modification, and discussions were held with ship designers to build understanding of the costs and risks of modification.

The comparative assessment of each option resulted in a recommendation in the Single Stage Business Case to acquire a second-hand vessel. Cabinet agreed to this recommendation in June 2018.

How Defence considered interoperability

Defence considered interoperability in the communications capabilities of the vessel, and the ability to conduct vertical replenishment and boat transfer operations with partners.

How Defence considered through-life costs and issues

The DHV through-life costs were assessed using a range of data sources, including:

- operating costs for the platform supplied by the ship owner
- modification costs, based on quotes from the ship owner and estimates from contractors
- personnel costs estimated based on a crew of 39 full-time equivalent personnel
- general operating costs based on costs from *Manawanui*, adjusted to take account of the greater complexity of the vessel and higher number of sea days.

Requirements Analysis in the Capability Definition Phase

- The systems required for a Dive and Hydrographic Vessel to meet New Zealand Defence Force requirements are listed in the table below, along with the capabilities these systems support:

Table 1: System requirements to deliver capability

	Dynamic Positioning System	Dive System	Hydrographic Survey System	Heavy Lift Crane	Military Communications System	Weapons and Armoury
Hydrographic Survey			■		■	
Rapid Environmental Assessment			■	■	■	
Route Survey	■	■	■	■	■	
Mine Counter Measures		■			■	■
Underwater Search and Recovery	■	■	■	■	■	
Explosive Ordnance Disposal		■	■		■	■
Maritime Presence[1]					■	■
Training	■	■	■	■	■	■

[1] "Maritime Presence" covers generic maritime capabilities such as search and rescue and defence diplomacy.

History of Cost Estimates in the Capability Definition Phase

	30 June 2018
Cost (NZ$ m)	103.416

Estimates of Acceptance Date made in the Capability Definition Phase

	Initial Estimate	At Contract Signing (August 2018)	Actual date achieved
Vessel delivery commences	January 2019 (start of voyage to New Zealand)	March 2019	March 2019 (Actual)
Vessel delivered	May 2019	May 2019	12 May 2019 (Actual)

ACQUISITION PHASE

Description of DHV Acquisition Work

Following the reprioritisation of funding, the diving and hydrographic vessel option became the preferred option for acquisition.

How Defence Decided to Acquire the Capability Solution

The project had noted that, due to a downturn in the oil and gas industry, purchasing a second-hand offshore support vessel for conversion to a dive and hydrographic vessel was comparable on a cost-benefit basis to purchasing a new purpose-built vessel.

Therefore options that were considered were:

- Commission a new build vessel
- Lease and modify a vessel
- Purchase and modify a second-hand vessel.

A market study was commissioned, which confirmed that the market at the time for offshore support vessel was at an historic low for both lease and purchase, and that – at the time the Ministry of Defence was looking for a suitable vessel – there were early signs of a recovery in the market that would affect ship availability and pricing.

Acquisition and modification of a second-hand vessel was recommended as the preferred acquisition option to ensure the project remained within budget and schedule, and to limit risk.

A commercial shipbroker provided an initial list of offshore support vessels that were available to the market. This was refined to around 150 vessels that had the potential to be suitable for conversion and use as a dive and hydrographic vessel, based on a number of requirements including accommodation on board, speed, deck area, build quality and price.

A further detailed assessment and evaluation process resulted in a shortlist of six vessels with the MV *Edda Fonn* identified as the preferred vessel in April 2018.

Risk reduction, clarification and due diligence activities

Risk reduction and clarification activities had taken place during February and March 2018, and the project team met with ship designers and equipment manufacturers, allowing the Project to:

- undertake due diligence activity in relation to the six shortlisted vessels
- monitor the market while the project was progressing towards contract
- assess customisation costs

- engage early with the Fleet Personnel Training Organisation to ensure sufficient suitably qualified and experienced personnel would be available to crew the ship.
- plan for the development of a support agreement.

Following identification of *Edda Fonn* as the preferred vessel, the vessel was assessed further prior to purchase. The Project Team, enhanced with RNZN personnel and supported by Babcock NZ (the Prime System Integrator), carried out a detailed inspection of the ship. A marine survey of the MV *Edda Fonn* was also conducted by an independent ship surveyor and marine consultant. These surveys confirmed the material condition of the vessel was very good, with the survey company stating the vessel was equivalent to a ship aged five to ten years younger.

An initial comparative seakeeping analysis was also undertaken by an independent contractor to explore the ship's seakeeping characteristics against those of HMNZS *Canterbury* and the RNZN offshore patrol vessels. The analysis assessed the expected characteristics of the vessel were it to be operated in the high to extreme sea conditions that occur in New Zealand's maritime area. It was concluded that the vessel's seakeeping performance was favourable when compared to *Canterbury* or the Otago Class offshore patrol vessels in most sea states, for a given speed and heading. The RNZN Naval Engineering Authority agreed that the initial seakeeping analysis showed *Edda Fonn* exhibited acceptable seakeeping characteristics for New Zealand waters.

The opportunity was taken for Project personnel to take part in 'sea-rides', embarking on the ship when it was carrying out commercial operations in the North Sea in September and October 2018. This greatly added to the knowledge of both the vessel, and helped with the development of procedures for when the ship is in service with the RNZN.

Contractual arrangements

On 20 August 2018 a Memorandum of Agreement was signed between the Chairman of Østensjø Rederi's Board and the Secretary of Defence. The MOA included:

- The purchase of MV *Edda Fonn*.
- Completion of stage one modifications to the vessel by Østensjø Rederi, including changes to the moon pool, installation and integration of a Surface Supplied Breathing Air diving system, installation and integration of a Remotely Operated Vehicle and associated systems and stations, and installation of a Multi Beam, and Single Beam Echo Sounder.
- Specific training in systems and equipment.
- The ship's delivery to New Zealand.

Stage 2 modifications – focused on specific communication and military systems and equipment. At the start of the new financial year the project was anticipating signing a contract for the first of two phases of equipment installation as part of this second stage of modifications to *Manawanui*. In August 2019 a contract covering some modifications was signed with Babcock NZ and work orders covering the communications works were issued.

A request for tenders (RFT) was released at that time for the remaining military modifications. Babcock NZ was also the successful tenderer for that work and that modification work was added to the first contract with Babcock, and additional work orders issued.

SCHEDULE/TIMEFRAME PROGRESS

The initial dates for completion of the activities in the table below were estimates at the time approval to commit to the purchase of the MV *Edda Fonn* was given by the Minister of Defence and the Minister of Finance.

	Estimate at approval to commit 19 August 2018	As at 30 June 2020 (Forecast/Actual)	Variation in acquisition phase (months)
Vessel purchased	August 2018	August 2018 (Actual)	0
Completion of Stage One modifications	March 2019	March 2019 (Actual)	0
Delivery of Vessel to New Zealand/Transfer of ownership to Crown	May 2019	May 2019 (Actual)	0
Completion of Stage 2 modifications	November 2019	October 2020 (Forecast)	11
Interim Operational Release (IOR)	April 2021	February 2020 (Actual)	-14
Operational Release (OR)	April 2021	April 2021 (Forecast)	0
At the time of approval to commit, IOR was forecast to commence November 2019 and end April 2021. OR was forecast to start March 2021 and conclude the following month.			

Explanation of variances

A phased Interim Operational Release for *Manawanui* was approved on 26 February 2020, earlier than the schedule date of April 2021 reported at 30 June 2019, and was achieved as part of a wider schedule adjustment to enable the vessel to participate in Exercise RIMPAC in 2020.

DHV CAPABILITY INTEGRATION PLAN[5]

As part of the project's Capability Integration Plan, a Test and Evaluation Master Plan (TEMP) was developed, detailing the range of test and evaluation requirements. The document is usually comprised of a number of supporting test and evaluation plans, which cover the progression of the project's phases.

For the DHV project, developmental testing and evaluation was conducted as part of Stage 1 modifications to the vessel, which were completed ahead of its delivery to New Zealand. This phase included observation by the project team of factory acceptance trials for systems being fitted into the ship.

Completion of installation of Stage 1 modifications led to the start of the acceptance test and evaluation (AT&E) phase. Harbour and Sea Acceptance Trials were completed in March 2019, confirming the materiel fulfilled the requirements and specifications of the contract. AT&E for this project is being completed progressively, with further Harbour and Sea Acceptance Trials to be completed following the Stage 2 modifications.

Operational test and evaluation will test systems in operating conditions to ensure an accurate

[5] Capability Integration Plan (CIP) replaced the Introduction Into Service Plan, a term used in previous editions of this publication. The CIP is a single, cohesive plan that details all planning and activities that need to be undertaken to properly integrate the capability. It is a 'living document' that is updated regularly.

evaluation of the capability can be made. For this vessel there will be a focus on:

- evaluating the ship's readiness for service
- identifying any issues with individual equipment, sub-systems or systems that may need to be addressed
- evaluating the support system (including training, safety and sustainability)
- validating the standard operating procedures that are being developed for the vessel and crew
- helping in the development of plans for the ship's operational use.

DHV OPERATIONAL CAPABILITY

Delivery of Operational Requirements

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

Operational Requirements	Likely to be met
Hydrographic Survey	Yes
Rapid Environmental Assessment	Yes
Route Survey	Yes (supporting capability) *Manawanui* will provide support for delivery of these capabilities.
Mine Countermeasures	
Underwater Search and Recovery	Yes
Explosive Ordnance Disposal	Yes
Maritime Presence (including search and rescue)	Yes
Training	Yes
Full benefits realisation is scheduled for implementation by March 2024.	

DURING THE 2019/20 YEAR

The tender process for the Phase 2 modifications for *Manawanui* took place in the first half of the financial year and in November 2019 installation of military systems and equipment began.

Along with work on the ship and systems, a master plan for a test and evaluation process was approved in September 2019, and *Manawanui* went to sea for the first time under Navy command on 17 February 2020. This formed part of the Operational Test and Evaluation Phase to enable assessment of both general seamanship and specific systems testing results, and Interim Operational Release was approved at the end of February 2020.

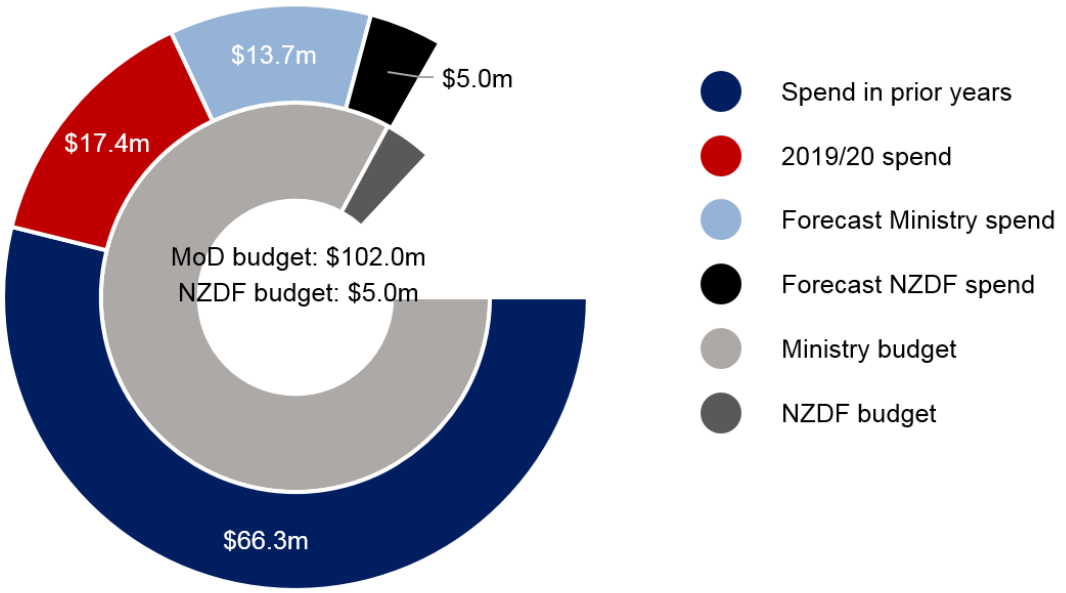
The key contract for services during this year was for a range of installation work (communications and military) under Stage 2 modification work covered by the contract signed with Babcock New Zealand in August 2019.

The impact of COVID-19

The new *Manawanui* was removed from dry-dock as Alert Level 4 was declared and prepared for possible deployment as part of the All of Government response. Work recommenced during Alert Level 3 (which commenced at 11:59pm, 27 April 2020), with appropriate restrictions in place.

The Capability Integration Plan was able to be re-scheduled internally to accommodate the effects of COVID-19 restrictions. The seven week lockdown period was expected to result in an extension to the Operational Release milestone. For some systems, the equipment's manufacturers require inspections, testing and/or training by a specialist technician. The impact of travel restrictions on this work was being monitored by the Project.

DHV PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Dive and Hydrographic Vessel project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	101,976	5,000	106,976
	Allowance for foreign exchange movements	2,770	-	2,770
	Original approved project budget	99,206	5,000	104,206
Forecast	Forecast total project cost	97,390	5,000	102,390
	Effect of foreign exchange movements	(396)	-	(396)
	Forecast cost using hedged rate	97,786	5,000	102,786
	Forecast project variance	1,420	-	1,420

DEVELOPMENTS POST 30 JUNE 2020

HMNZS *Manawanui* completed Exercise RIMPAC in Hawaii, exercising with other ships from around the world, and completed 54 continuous days at sea. This included a stop in Tonga on the return trip, where a container of medical equipment was unloaded. During this time the crew continued to observe COVID-19 distancing rules, with no direct contact with anyone outside the ship's staff.

Once back at Devonport Naval Base a planned 5-week period of maintenance and continued modifications commenced.

Following this the ship will commence salvage the (Remote Operated Vehicle and Subsea Crane) Operational Test and Evaluation phase.

FIXED HIGH FREQUENCY RADIO REFRESH

The Fixed High Frequency Radio Refresh project is replacing the New Zealand Defence Force's existing high frequency radio system, which is at the end of its economic and operating life. It will increase the efficiency of system delivery through the rationalisation of the number of radio sites.

THE PURPOSE OF THIS PROJECT

The New Zealand Defence Force's (NZDF) existing high frequency (HF) radio system is approaching forty years old and, even with maintenance over time, has reached the end of its life. The Fixed High Frequency Radio Refresh (FHFRR) project addresses this by modernising and upgrading the high frequency radio system and ensuring through-life support. This project was formerly known as Strategic Bearer Network Project – Phase Two.

High frequency radio is an important part of NZDF's communications network. It enables long range communications with smaller assets that are deployed far from New Zealand, and provides resilience by acting as a back-up capability if satellite communications are unavailable.

A viable and sustainable high frequency radio system supports NZDF in delivering against the Community, Nation, and World outcomes in the Strategic Defence Policy Statement 2018 in the following ways:

- It supports NZDF operations in the South Pacific and within our Exclusive Economic Zone, where a range of assets rely solely on high frequency radio for long-range communications;
- It is part of a suite of communications tools, including satellite communications, which enable NZDF to operate independently, or lead operations with other government agencies and coalition partners; and
- It is an alternative communications medium for strategic communications with ships and aircraft deployed further afield.

CAPABILITY REQUIREMENTS

To support these policy outcomes, the following investment objectives and requirements were derived for the FHFRR project:

- Communications assurance – to retain alternate communications channels to satellite for deployed force elements. This is necessary for safer and more successful operations, and to provide a back-up system that can be provisioned at short notice.
- Retain communications with deployed force elements unable to use satellite communications. HF radio enables communications to be sent and received as needed.
- Retain communications south of 60^{o} south in the Southern Ocean. Communication with platforms via satellite is difficult or unavailable in this area, and HF enables command and control and other information to be conveyed.
- Improve the efficiency of the high frequency radio capability through the rationalisation of equipment and consolidation of facilities as some radio communications migrates to satellite, and replacing end of life equipment with new equipment.
- Utilise new technology to improve the effectiveness of the high frequency radio capability, with modern equipment providing wider and more efficient communication.

FHFRR Better Business Case Milestones

2014	
4 June	**Project charter** approved by Secretary of Defence and Chief of Defence Force
2018	
18 June	Cabinet authorised Defence to undertake a competitive Request for Proposal process and evaluations to select a fixed high frequency radio capability as documented in the **Single Stage Business Case** CAB-18-MIN-0281
2019	
26 August	Joint Ministers (Defence and Finance) approved **implementation of approval thresholds.** This was agreed to by Cabinet in October 2018 as part of the investor confidence rating assessment of Defence and delegated approval of the FHFRR Implementation Business Case to the Minister of Defence (previously required to be approved by Cabinet). GOV-18-MIN-0075
2020	
19 February	The Minister of Defence agreed to proceed with FHFRR and authorised the Secretary of Defence to conclude acquisition and through-life support contracts as outlined in the **Project Implementation Business Case (PIBC)**.

CAPABILITY DEFINITION PHASE

Over a 68 month period between June 2014 and February 2020 (from Charter to PIBC approval) the project worked through a definition phase that included a two-part tender process, issuing both a Request for Proposals (RFP) and request for Best and Final Offers (BAFO).

How Defence identified and assessed operational requirements

Investment logic mapping in September 2014 determined key problems associated with the existing high frequency radio capability and the benefits that would occur from addressing those problems. The following were identified:

Problems:

- Deterioration of HF radio capabilities has the potential to impact operations within our region.
- If our satellite communications become unavailable, NZDF's military capability will be severely diminished.
- Our inability to meet the burgeoning demand for data through new technologies is constraining our operational choices.
- Duplication of communications infrastructure causes inefficient delivery.

Benefits:

- Safer, more successful operations through more self-reliant command and control.
- Greater certainty that the Defence Force can meet government requests now and in the future.
- Greater ability to maximise return on investment in new technologies.
- More efficient communications across the range of capabilities.

How Defence analysed options in the Capability Definition phase

The FHFRR project team developed a matrix of long list options to replace NZDF's current high frequency radio capability. A facilitated Multi-Criteria Decision Analysis (MCDA) was held to

assess the long list options, which resulted in the following options being shortlisted:

- **Option A** – this option retains the status quo, meaning that the system will be maintained until it eventually fails and will not be replaced;
- **Option B** – this option replaces the control system, reduces the number of radio sites, and reduces the number of channels. It does not upgrade to wideband radio technology, nor does it put in place support arrangements;
- **Option C** – this option is similar to Option B, but provides a greater number of channels (although this is still a reduction compared to present numbers). It introduces a mix of wideband and narrowband radio technologies and includes long-term support arrangements; and
- **Option D** – this option builds on Option C by increasing the number of channels from the previous option (still less than the current number). It also maintains a mix of mainly wideband radio technologies and involves taking up long-term support arrangements.

The project then considered the extent to which each option fulfilled the five critical success factors, with the findings shown below:

Critical Success Factors	Options			
	A	B	C	D
Strategic fit and business needs	No	Partial	Partial	Yes
Value for money	No	Partial	Yes	Yes
Supplier capacity and capability	Yes	Yes	Yes	Yes
Affordability	Yes	Yes	Partial	No
Achievability	Yes	Partial	Yes	Yes

How Defence considered interoperability

Upgrading NZDF's high frequency radio capability will ensure the continued ability to interoperate with New Zealand's Defence partners, with Government agencies in New Zealand, and with our neighbours.

How Defence considered through-life costs and issues

Through-life costs were calculated on the assumption that the upgraded capability would have a useful service life of 20 years and a residual value of zero.

Initial cost estimates were determined based on pricing information provided by industry in response to a Request for Information, cost information from other representative operators, and internal estimates of current operating costs.

Requirements Analysis in the Capability Definition Phase

Advantages	Disadvantages
Option A ($20.5m cost estimate[6])	
Affordable. No change required.	Does not provide an enduring communications solution.
Option B ($28.4–30.5m)	
Affordable. Achieves 75% of the required capacity.	Does not provide NZDF with an acceptable level of resilience in relation to its HF network.
Option C ($47.9–55.8m)	
Provides for the bulk of expected usage (98% of current usage).	Utilises a mix of modern and legacy radios.

[6] Cost estimates are for whole of life cost, assuming a 20 year useful service life and NPV discounted at 7%.

Option D ($51.6–59.3m)	
Meets NZDF current and future requirements. Greater capacity for All of Government usage.	Provides only marginally better capacity than Option C but at a higher cost.

Option C was recommended as the preferred option. It provides most of the benefit of an upgraded system in terms of meeting capacity requirements for current usage (relative to the cheaper Option B). Option C also provides greater value for money as it provides only marginally less capacity than Option D for a lower whole of life cost.

Description of the Capability and Operational Requirements

The NZDF's Capability Requirements are:

1. To enable strategic communications assurance and effective command and control of deployed units in the event that other communications bearers are unavailable.
2. To allow communications with smaller deployed forces physically unable to use satellite.
3. To enable communications with deployed force elements south of 60° south.
4. To improve the efficiency of the current high frequency radio system by rationalising the equipment being used and replacing obsolete equipment.
5. To provide a more effective communication service that is able to communicate with the Defence Force's next generation of capabilities.

Cost Estimate in the Capability Definition Phase

	2018
Estimate (NZ$ m)	20.8–27.2

Estimates of Acceptance Dates in the Capability Definition Phase

	Initial Estimate during Definition
Initial Operational Release	May 2021
Operational Release	January 2022

ACQUISITION PHASE

Description of acquisition work

The procurement strategy proposed in the Single Stage Business Case was to hold a competitive tender process for the provision of the fixed high frequency radio system under a purchase contract, and the ongoing support of the system under a through-life support contract.

In June 2018, Cabinet authorised Defence to approach to market with a competitive Request for Proposals process and undertake evaluations to select a fixed high frequency radio capability.

How Defence decided to acquire the Capability Solution

Request for Proposals

The open tender process commenced with a Registration of Interest process. This process invited respondents with the capacity, credibility, and ability to secure appropriate security clearances to express interest in receiving a Request for Proposal for the FHFRR project.

In August 2018, a Request for Proposals was issued to six respondents who had been preselected through the Request for Information process. The objective of the request was to invite respondents to submit proposals for the delivery of a fixed high frequency communications capability that will support NZDF's deployed and domestic operations in a sustainable manner, with appropriate consideration given to through-life support. Four proposals were received from three respondents (one company submitted two proposals).

These proposals were evaluated in accordance with the approved Tender Evaluation Plan. As none of the proposals were both within budget and met NZDF's minimum requirements, the decision was made to invite the three respondents to prepare and submit a Best and Final Offer.

Best and Final Offers

A request for Best and Final Offers was released based on the following revised project scope:

- A reduction in the total number of communications circuits; and
- A reduction in the total number of Internet Protocol (IP) capable channels.

All three respondents submitted responses. The evaluation of the Best and Final offers identified Babcock New Zealand Ltd as the preferred tenderer to upgrade NZDF's fixed high frequency radio capability and to provide through-life support.

Due Diligence

Due diligence was undertaken with Babcock in June 2019. The due diligence activity provided further opportunity to assess how the proposed solution would be delivered, assess the maturity of the proposed solution, assess how Babcock would managed its prime contractor responsibilities, and assess Babcock's ability to sustain the capability through-life.

Contract Negotiation

Initial contract negotiations were undertaken with the preferred supplier, Babcock NZ Ltd, in late 2019.

Following approval of the Project Implementation Business Case in February 2020, a contract was signed with final systems acceptance scheduled to occur in December 2022.

Contract Status at 30 June 2020

Prime contractor	Babcock New Zealand Ltd

SCHEDULE/TIMEFRAME PROGRESS

Systems Acceptance: variations in forecast

Estimate at Approval to Commit	30 June 2020 Forecast/ Actual	Variation in acquisition phase (months)
December 2022	March 2023 (Forecast)	3
The three month delay to systems acceptance resulted from COVID-19 impacts on operations, but does not affect the operational release date of August 2023.		

FHFRR CAPABILITY INTEGRATION

Description of Capability Integration Phase

HF is a critical alternative communications channel for NZDF operations and shall be maintained at a level that will not risk impeding operations. Decommissioning of equipment and sites during the upgrade will reduce the number of available operational circuits. The transition to the new HF system will be carefully planned to ensure that both new and legacy systems have sufficient capability to maintain minimum operational requirements.

Status of the Capability Integration Plan

A Capability Integration Plan (CIP) has been approved and identifies and schedules the tasks necessary to prepare the NZDF to effectively operate the capability and introduce it into service. The CIP outlines the steps required to deliver the Operational Release of the Project, including integrating the capability into NZDF systems and processes.

Benefits Realisation

Full benefit realisation is expected to be achieved by the end of 2022.

Schedule of Capability Integration

	Initial Forecast	30 June 2020 (Forecast/Actual)	Variance (months)
Interim Operational Release	30 March 2023	21 March 2023	Nil
Operational Release	31 August 2023	31 August 2023	Nil

FHFRR OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Capability

Operational Capability	Capability likely to be met
Communications assurance Retain communications with deployed force elements unable to use satellite communications Retain communications south of 60º South in the Southern Ocean Improve HF radio capability efficiency Utilise new technology to improve the effectiveness of the capability	Yes.
Benefits realisation is scheduled for full implementation in 2022.	

DURING THE 2019/20 YEAR

Along with the preparation of the implementation business case, negotiations were completed with the preferred tenderer, and the contract was signed in February 2020.

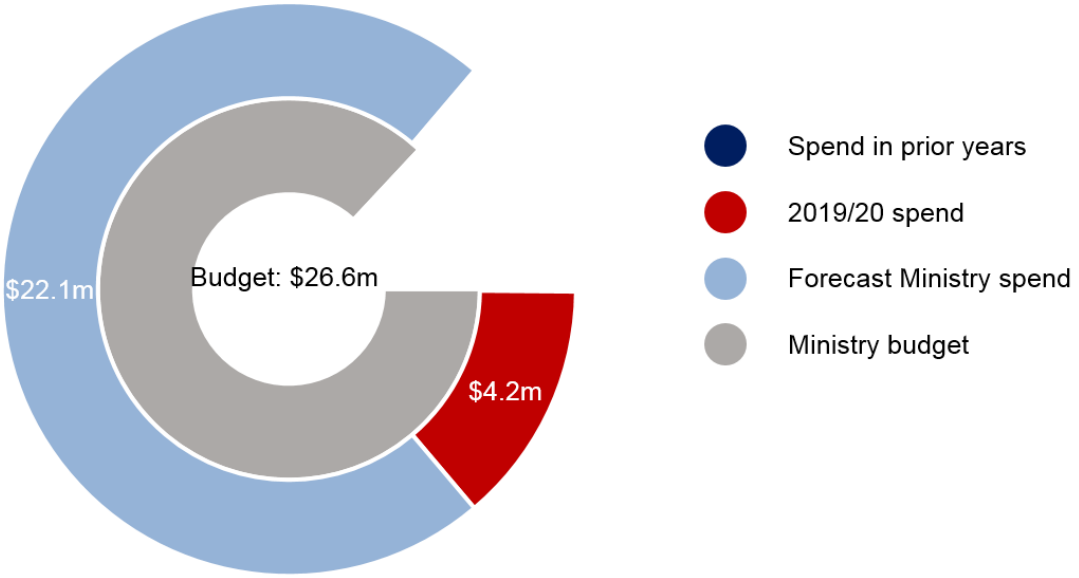
Babcock New Zealand commenced its design activity. Physical surveys of the proposed HF sites in New Zealand were completed to identify and scope all of the works to be carried out.

The government-furnished equipment (HF radio equipment) was sent to the United Kingdom for use by Babcock for the design and testing of the new system.

The impact of COVID-19

The impact of the pandemic, specifically lockdown in both New Zealand and the United Kingdom was being assessed at the end of the financial year, particularly in relation to the project's schedule. An immediate effect was a delay in shipping equipment to the United Kingdom, which impacted Babcock's ability to progress the system design and establish a System Integration Laboratory (SIL). The resulting schedule delay is able to be accommodated within the project's schedule contingency and is not expected to impact the delivery of the capability.

FHFRR PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Fixed High Frequency Radio Refresh project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	26,580	-	26,580
	Allowance for foreign exchange movements	-	-	-
	Original approved project budget	26,580	-	26,580
Forecast	Forecast total project cost	26,351	-	26,351
	Effect of foreign exchange movements	(127)	-	(127)
	Forecast cost using hedged rate	26,477	-	26,477
	Forecast project variance	103	-	103

DEVELOPMENTS POST 30 JUNE 2020

System design activities that began during the 2019/20 year have continued, with a preliminary design review completed in October.

Surveys and layout planning for transmitter and receiver sites, and operations centres commenced and was completed by September. This was followed by the start of planning for new installations at each site, which is underway and progressing.

The SIL has been established at Babcock in the United Kingdom and system design is progressing and the Preliminary Design Review was completed in October 2020.

FUTURE AIR MOBILITY CAPABILITY - TACTICAL

The primary objective of this phase of the Future Air Mobility Capability Project is to replace the Royal New Zealand Air Force's tactical airlift capability – an aging fleet of C-130H Hercules. This will allow the New Zealand Defence Force to maintain timely and effective air transport mobility capability for military and wider government response options.

THE PURPOSE OF THIS PROJECT

The C-130H aircraft are approaching the end of their economic life, with inspection and analysis suggesting that the fleet is able to be maintained as airworthy until at least the early to mid-2020s. In addition, maintenance costs are increasing, and the airframe structure will soon reach the point where the cost and effort required to inspect and remediate structural issues may further impact availability and the ability to retain capability during the managed transition to the new aircraft over a period of time.

The Future Air Mobility Capability (FAMC) project was initiated in 2017 to look at the future of the air mobility capability provided by the Royal New Zealand Air Force (RNAZF). FAMC examined options for air mobility, identified key priorities and made recommendations for the preferred replacement for the C-130H.

Five investment objectives were identified for this project:

- The Defence Force retains an air mobility capability that provides timely and effective air mobility for military response options;
- The Defence Force retains an air mobility capability that provides timely and effective air mobility for wider government response options;
- The Defence Force retains an air mobility capability that is for the sole use of New Zealand, and able to be employed at the Government's discretion;
- The Defence Force retains an air mobility capability that can support up to three concurrent air mobility operations; and
- The air mobility capability is interoperable with that of key defence partners.

CAPABILITY REQUIREMENTS

The capability requirements necessary to support these objectives are:

- The Defence Force needs a reliable, available and supportable airlift fleet to project and support sustained military operations into the future.
- A reliable, available and supportable airlift fleet is needed to support non-military Government tasks into the future.
- Due to the risks associated with some military airlift operations, and the requirement for a high level of readiness to support a number of non-discretionary and time-sensitive tasks, there is a need for New Zealand to at least own the tactical airlift component within a wider fleet mix.
- The Defence Force and Government agencies need a sufficient reliable and supportable airlift fleet to allow for concurrent tasks.
- The future airlift fleet needs to be interoperable with that of key defence partners.

In addition to these essential requirements, Government agencies registered a number of desirable requirements for the future capability:

- Enhanced surveillance capability for humanitarian and disaster relief missions.
- Reliable cargo and passenger transportation to Antarctica that has no point of safe return.
- Enhanced VIP transport capability.

FAMC Better Business Case Milestones

2017	
10 July	Cabinet approval of the **Indicative Business Case** CAB-17-MIN-0366
6 September	Approval of the **Project Charter** by the Secretary of Defence and Chief of Defence Force
2019	
10 June	Cabinet approval for the Secretary of Defence to undertake a formal FMS process for procurement of C-130J-30 tactical aircraft, simulator and associated services and support as proposed in the **Detailed Business Case** CAB-19-MIN-0268
2020	
2 June	Cabinet approval of procurement via FMS of five C-130J-30 Hercules, training and support equipment, a simulator, and sustainment as recommended in the **Project Implementation Business Case** CAB-20-MIN-0251

CAPABILITY DEFINITION PHASE

The definition phase took place over a 33 month period from approval of the project charter in September 2017, to Cabinet's decision on the Project Implementation Business Case in June 2020.

How Defence identified and assessed capability and operational requirements

The Indicative Business Case developed a comprehensive long list of possible options for consideration by stakeholders:

- Scale, scope and location: what levels of coverage are possible?
- Service solution: how can airlift be provided?
- Procurement model: how can Government procure air mobility?
- Implementation: when can services be delivered?
- Funding: how can it be funded?

A workshop was convened on 22 September 2016 where subject matter experts evaluated all potential long list options against the project's investment objectives and the critical success factors.

Following this analysis, the Indicative Business Case identified four shortlist options for further detailed analysis:

- Option 0: do nothing: no replacement of current capability (retained as a baseline comparator).
- Option 1: replacement of current capability by procuring a fleet of one aircraft type – a single fleet mix.
- Option 2: replacement of current capability by procuring a fleet of two aircraft types – a dual fleet mix
- Option 3: replacement with an enhanced level of capability.

A multi criteria decision analysis (MCDA) process, involving stakeholders from across the Defence Force and other government agencies, was undertaken in September 2017 to assess fleet mix benefits, costs and risks. The MCDA process examined different numbers of different types of aircraft that were relevant to the project. It included development of a spectrum of plausible fleet mixes for consideration by decision-makers and the criteria against which senior evaluators could evaluate the relative value of these fleet mixes.

The following aircraft classes were in scope for the project: corporate business jet, civilian combi, civilian medium, civilian large, military light tactical, military medium tactical, and military heavy strategic.

The MCDA looked at the whole air mobility fleet, not just the military tactical transport component. A total of 17 fleet mixes were considered by stakeholders. All 17 fleets were judged to be

able to meet the overall air mobility requirements and potentially deliver the desired benefits. However, the MCDA process suggested that some would deliver more benefits than others.

An initial assessment of the MCDA drew the following conclusions:

- A military transport aircraft is essential to meeting the requirements (an air mobility fleet comprising only civilian types is not viable);
- The majority of the overall fleet needs to be military transport aircraft; and
- Seven is the functional minimum size for the overall air mobility fleet.

The MCDA evaluation of the fleet mixes took place in September 2017. The overall conclusion was that:

- Military Medium transports should form the core of any future air mobility fleet; and
- A minimum overall air mobility fleet of seven is desirable.

How Defence analysed the requirements options in the Capability Definition phase

Defence released a Request for Information (RFI) in mid-2016 to canvass the market for potential air mobility options. All major aircraft suppliers responded with various air mobility solutions.

Request for Information responses and other market research indicated that two aircraft were considered to be in the Medium Tactical class as it related to New Zealand's requirements: the Lockheed Martin C-130J (Hercules) and Embraer KC-390.

It was recommended that the KC-390 be discounted from consideration as, at that time, it represented a considerable risk and this recommendation was accepted by Cabinet in June 2019. There was a high degree of uncertainty around its price, and, with no operators at the time of the decision, there was no history of support, training or maintenance. Additionally, the aircraft being made outside of the five eyes nations was going to create issues with installing and integrating the required systems. The onus of bringing the aircraft up to an operating capability would have fallen primarily on New Zealand. In comparison, the C-130J was a proven aircraft in service with over 20 nations, and in particular all of our five eyes Allies.

This approach was in line with the findings of the independent Review of Defence Procurement led by Sir Brian Roche, which concluded that Defence should "avoid solutions that are unproven, highly developmental and/or unsupported by a reliable evidence base".

The Project Implementation Business Case considered how many C-130J aircraft were necessary. As noted above, the Detailed Business Case analysis looked at the entire air mobility fleet and found that seven was the functional minimum size for the overall air mobility fleet, with medium tactical aircraft as the core. As the current air mobility capability has two B757s, any consideration of a medium tactical replacement has to start from the base of the current two B757 aircraft.

The Project Implementation Business Case noted that our aging fleet of C-130H aircraft are struggling to meet existing demands: the number of aircraft available for operations on any particular day, the range of operations that can be undertaken, and the ability to respond and undertake concurrent tasks are all limited. Further, they will not meet the future demands for response and concurrency that Government has forecast through its policy priorities.

It is estimated that the new C-130J fleet should have around double the availability of the current fleet. This means that from a five aircraft fleet three aircraft should always be available, taking into account scheduled and unscheduled maintenance demands. This would also mean that often four aircraft may be available, especially to meet pre-planned tasks where maintenance can be scheduled around forecast mission.

Reducing the fleet size to four, even factoring in the availability increase, would not consistently provide three aircraft available for operations, which is the minimum needed to deliver against

policy. Five aircraft are the minimum number required to consistently deliver three available aircraft and meet the response and concurrency requirements of Government, whilst also offering the capacity to achieve future expansion of mandated Government outputs and provide surge capacity.

How Defence considered interoperability

The current airlift fleet is interoperable with key partners. The ability to perform airlift missions jointly with or on behalf of partners has been a valuable contributor to New Zealand's defence relationships and to shared security objectives. Therefore, one of the five investment objectives identified for this project is that the air mobility capability is interoperable with that of key defence partners.

One of the key criteria used for determining the preferred option was:

- *Community size/Close relationship with community* - Being part of a group of partner countries with the same platform provides access to critical mission and logistics support in different locations. It would be best for New Zealand to participate in as large a user community as possible, with as many friends as possible, for support.

This was one of the criteria that determined the C-130J was the preferred option. Over twenty countries had fleets of C-130J aircraft, including Five Eye partners Australia, Canada, the United Kingdom and the United States.

The C-130J can be procured either commercially from the manufacturer, or through the US Government Foreign Military Sales (FMS) system. The Detailed Business Case recommended purchase of the C-130J through the US Government FMS system as it offers a number of advantages over a direct commercial sale procurement, one of which is interoperability advantages.

How Defence considered through-life costs and issues

The estimated whole of life costs of the aircraft and systems are based on:

- Initial capital investments that include: five C-130J-30 Hercules Tactical aircraft complete with EO/IR, civilian SATCOM system, and all aircraft fitted for large aircraft infra-red counter measure, with three fitted; initial spares; initial capital support items; full motion simulator (Level D); initial capital deployment requirements; integrated logistics support costs; infrastructure; training and personnel costs; and, estimated end-of-service life disposal costs.
- Foreign Military Sale acquisition process for the airframes, initial aircraft spares, simulator systems, initial training and publications, and other support equipment. The capital costs of the equipment components are based on not to exceed price contracts with the USAF.
- Through-life capital investment reflecting future upgrades and refreshes, through-life capital sustainment, and rotables.
- Through-life operating costs of personnel, direct operating costs and consumables, ongoing training, and maintenance and utility costs.
- The key operating and personnel cost drivers: aircrew numbers and aircrew size, fuel burn, and planned flying hours. The C-130J-30 capability is to operate from one operating base and with one squadron (the unit operating the current C-130H – No. 40 Squadron).
- Personnel requirements being: six crews, maintainers, and logistics support personnel. Other than a simulator manager, no personnel costs are included to operate the simulators/training devices as the Defence Force is planning to use external contractors.
- Defence will internally conduct the two levels of aircraft maintenance and after the initial six year deeper servicing will determine the necessary arrangement for the second deeper level cycle and repaint that occurs 12 years after introduction.
- The Defence Capability Plan Review 2019 economic assumptions for inflation and

forward foreign exchange rates from the Treasury's New Zealand Debt Management office. Foreign exchange risks for projects are managed through forward cover of currency as soon as approval to commit to contract is received.

- Aircraft delivery planned from December 2024 with initial operating capability release expected during FY 2024/25. Expenditure will be capitalised and created at the initial operating capability date encompassing all the capital costs up to that date. Full operating release is planned for December 2025.
- A 30-year service life with each aircraft system, with initial operating capability starting the first year after delivery to the designated main operating base (Whenuapai).
- Infrastructure investment includes a new simulator building and security improvements to the hangars and storage facility. The C-130J-30 fleet will be accommodated in the existing 40 Squadron Hangar and 5 Squadron Hangar.
- Initial capital investment delivery contingency is based on the results of Quantitative Risk Analysis workshops, and project team estimate.

Requirements Analysis in the Capability Definition Phase

The Indicative Business Case assessed that the preferred way forward was to discard shortlist option zero, and to further explore shortlist options one, two and three in a detailed business case.

Description of the Capability and Operational Requirements

Capability Requirements necessary to support policy objectives include:	**Operational Requirements** necessary to support the capability include:
1. The Defence Force needs a reliable, available and supportable airlift fleet to project and support sustained military operations into the future. 2. A reliable, available and supportable airlift fleet is needed to support non-military Government tasks into the future	1. Due to the risks associated with some military airlift operations, and the requirement for a high level of readiness to support a number of non-discretionary and time-sensitive tasks, there is a need for New Zealand to at least own the tactical airlift component within a wider fleet mix. The requirement to own does not apply for an aircraft dedicated to strategic airlift operations or non-military Government tasks where military airlift attributes are not needed. 2. The Defence Force and Government agencies need a sufficiently reliable and supportable airlift fleet to allow for concurrent tasks. 3. The future airlift fleet needs to be interoperable with that of key defence partners.

History of Cost Estimates in the Capability Definition Phase

	2017	2019
NZ$(billion)	$1.6 – $3.4	$1.414
Cost estimates developed in the 2017 Indicative Business Case were based on replacement of both Tactical and Strategic Fleets and ranged across all three options. The 2019 figure reflects the tactical fleet costs only. These are initial capital cost estimates.		

ACQUISITION PHASE

Letters of Request seeking details on cost for the aircraft, a full flight simulator, training and sustainment support were submitted under the US Government Foreign Military Sales programme, following the Government's announcement in June 2019 that the Lockheed Martin C-130J-30 Super Hercules was the preferred platform.

DURING THE 2019/20 YEAR

Final Letters of Offer and Acceptance were received in early 2020 and the Government approved the business case for the purchase of five Super Hercules, the simulator, training and sustainment and infrastructure costs to deliver the new tactical airlift capability.

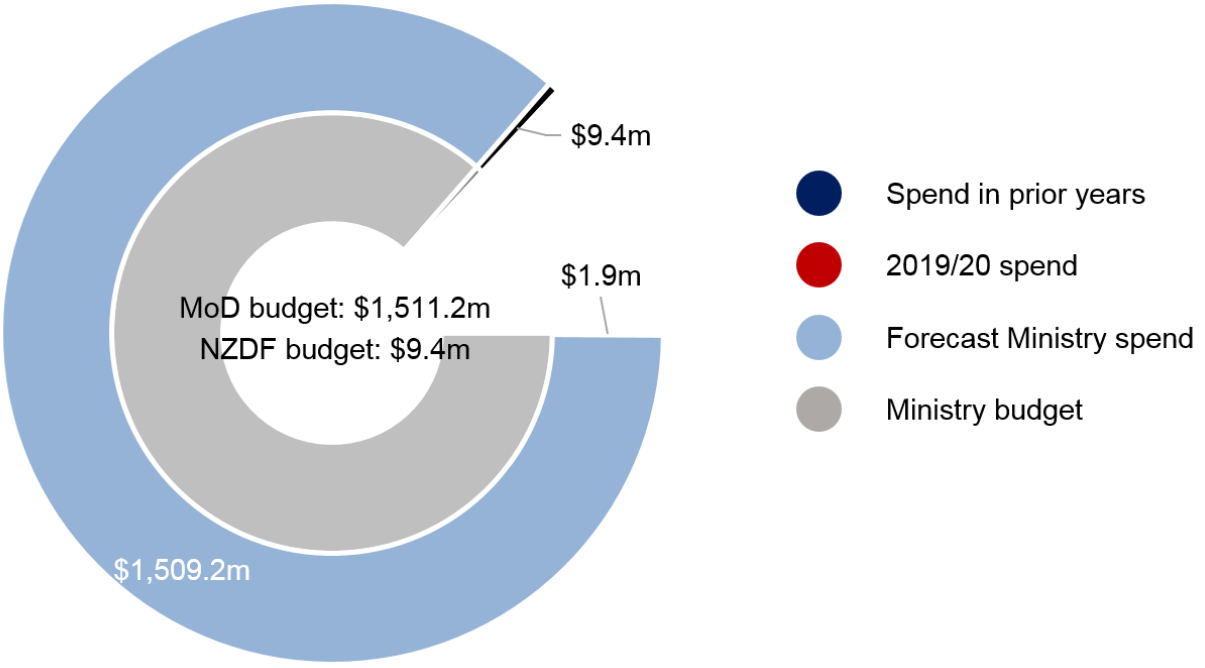
The impact of COVID-19

There were no known impacts on the project during the year as a result of the COVID-19 pandemic.

C-130J-30 Hercules (artist's impression supplied by Lockheed Martin).

MANATŪ KAUPAPA WAONGA
NEW ZEALAND MINISTRY OF DEFENCE

FAMC PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Future Air Mobility Capability – Tactical project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	1,511,233	9,392	1,520,625
	Allowance for foreign exchange movements	-	-	-
	Original approved project budget	1,511,233	9,392	1,520,625
Forecast	Forecast total project cost	1,511,154	9,392	1,520,546
	Effect of foreign exchange movements	-	-	-
	Forecast cost using hedged rate	1,511,154	9,392	1,520,546
	Forecast project variance	79	-	79

DEVELOPMENTS POST 30 JUNE 2020

Work with the US Air Force Program Management Agency finalised the statement of work for the US Government to issue to Lockheed Martin for production of the C-130J-30 aircraft.

The project team worked with NZDF to continue to develop the plans and schedules for the introduction and integration of the new capability.

MARITIME SUSTAINMENT CAPABILITY

The arrival of HMNZS *Aotearoa* in New Zealand in June 2020 marks a significant milestone in the Maritime Sustainment Capability project, which is delivering an enhanced replenishment tanker and will provide a capability that is better able to support land operations. As it is polar code-compliant, the ship will be able to operate to Antarctica in the summer season.

THE PURPOSE OF THIS PROJECT

New Zealand's geostrategic environment is unique; no other country of comparable size and political and economic standing has to be able to – at a minimum –deploy equipment and personnel from the Equator to Antarctica.

Naval tankers extend the endurance and range of vessels and other capability such as helicopters.

The former Royal New Zealand Navy replenishment tanker, *Endeavour*, played a key supporting role in the NZDF's ability to deliver its principal roles, and the ship significantly increased the utility of the Defence Force's naval combat capability.

Prior to the retirement of *Endeavour* in 2018, the Maritime Sustainment Capability project was set up to deliver a new replenishment capability. This would 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 project 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.

In August 2018 keel laying commenced at Hyundai Heavy Industries' shipyard, Ulsan, Republic of Korea.

MSC'S GOVERNMENT APPROVAL MILESTONES

2011	
26 January	Original **Project Charter approved** by Deputy Secretary (Policy), Ministry of Defence, and Vice Chief of Defence Force.
2012	
23 October	Cabinet 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. CAB (12) 37/4
2014	
30 June	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. CAB Min (14) 22/9
2016	
4 July	Approval of **Project Implementation Business Case** – agreed that the replacement MSC 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]. CAB-16-MIN-0313

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, and would replace what was at the time the Defence Force's 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 meant 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 conduct maritime sustainment, and support its own maritime operations and those conducted with partners.

The *Defence White Paper 2010* 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. That paper outlined two broad options for the project; a like-for-like replacement of *Endeavour*, or a replacement that 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 the ship to sustain operations by multiple helicopters.

The estimated capital cost was $452 million.

Cabinet also noted that Defence was 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, to increase the ability to replenish New Zealand's 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 requirements options in the Capability Definition phase

Options available for the replacement ship 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 MSC and operational requirements

Option 1: 'Renew' naval tanker: $358-$418 million

Advantages: Delivers the same level of capability as *Endeavour* provided when it entered service in 1988. 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 provided by commercial charter if needed.

Disadvantages: 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 million

Advantages: 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.

Disadvantages: 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 3: 'Enhanced' naval tanker: $389-$452 million

Advantages: A commercial naval tanker with selected military features. It would effectively upgrade the NZDF's maritime, land and air replenishment capability to support a large-scale, amphibious-capable Joint Task Force.

In addition to 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.

Disadvantages: 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 million

Advantages: 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.

Disadvantages: It would not have the ability to operate in Antarctic waters. Higher capital cost than other options.

Option 5: Additional bolt on option (Antarctic support option): $493 million ($64 million for ice features)

Advantages: 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.

Disadvantages: 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

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 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

Estimates of Ship Acceptance Date made in the Capability Definition Phase

Initial	May 2020[7]
At Contract Signing	May 2020
Actual	June 2020
Note: The ship was provisionally accepted on 10 June 2020 for delivery to New Zealand.	

[7] 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 and provided the Project with:

- confidence that both Shipyards could deliver a credible solution;
- clarification of the achievability of the Maritime Sustainment Capability requirements; and

- 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:

- addressed clarification questions that had been generated from the Tender evaluation activities;
- committed to equipment selection for key systems, aligned with the Project's Makers List or agreed alternatives; and
- 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 were established with suppliers of services or systems; examples of this are the shipyard superintendence services and the supply of government furnished equipment. The Project Team has been responsible for the facilitation and management of these contracts.

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

SCHEDULE/TIMEFRAME PROGRESS

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

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

History of variations to schedule

Date of individual variation	Variation length (months)	Explanation
October 2017	6	Preliminary Design Review (PDR): The scheduled April 2017 completion date for the PDR was not met and in May that year the project was forecasting 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) was delayed until April 2019 but the overall schedule remained within baseline. HHI advised that it was quicker to complete a greater level of outfitting before construction blocks were assembled in the dry-dock.

CAPABILITY INTEGRATION

Description of Capability Integration phase

At the time the Project Implementation Business Case was being developed, it was envisaged that Introduction into Service, as it was referred to at the time, would run concurrently with some earlier project stages, 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 Sea Trials (which took place in the first half of 2020). During these trials the Defence Force test and measure 'total system performance' against the original User/System Requirements and use this to advise whether or not the originally envisaged capability has been delivered. Some systems will be tested following the ship's arrival in New Zealand.

Introduction into Service would be completed when Operational Release was reached and where the Project Sponsor (Chief of Navy) agreed that the project outcome reflects the User Requirements Document.

Status of the Capability Integration Plan

Version one of the MSC Capability Integration Plan (CIP), which replaced the proposed Introduction into Service Plan, was approved by the MSC Project Board in April 2019. Development of version two was underway.

Schedule of Capability Integration

	Initial Estimate	30 June 2020 (Forecast)	Variance (months)
Initial Operational Release	December 2020	December 2020	0
Operational Release	November 2021	First quarter 2022	2
Benefits Realisation	January 2022	First quarter 2022	0
The planned voyage to Antarctica in the summer of 2021/2022 is the final activity required for the capability to achieve operational release. This cannot take place until at least November 2021 but is now expected to be completed by the end of January 2022.			

MSC OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements as at 30 June 2020

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 December 2020 through to Operational Release in the first quarter of 2022.
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.		

Operational Requirements	Requirement likely to be met	Comment

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 the end of the first quarter of 2022.		

DURING THE 2019/20 YEAR

Internal fit-out work continued on *Aotearoa* along with the completion of Harbour Acceptance Trial's (HATs) and milestones such as Main Engine start.

The Ship's Naming Ceremony (image below) was held in Ulsan, South Korea on 25 October 2019 attended by Ship's Sponsor the Governor-General, Her Excellency Dame Patsy Reddy and the Prime Minister of the Republic of Korea, Lee Nak-yeon.

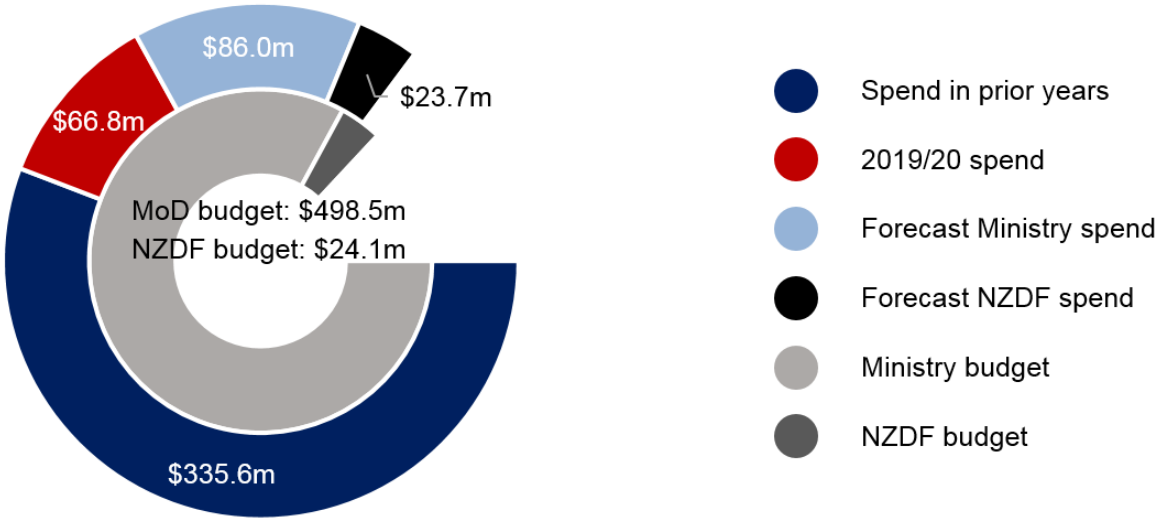
In December 2019 Hyundai Heavy Industries undertook builder's sea trials. These allowed the company to balance the complex electro-diesel propulsion system and undertake testing and refinement ahead of Sea Trials in February 2020.

In March 2020, in response to the COVID-19 pandemic, Defence personnel were repatriated from South Korea. Some project and Royal New Zealand Navy personnel remained in Ulsan to continue with sea trials.

On 8 June 2020, the ship was provisionally accepted for delivery to New Zealand. This was one month after *Aotearoa* had been scheduled to be accepted for delivery. Two days later on 10 June 2020, *Aotearoa* set sail from the port of Ulsan, escorted by the Republic of Korea fleet support tanker *Daecheong*, for Devonport Naval Base.

She arrived on 26 June 2020 and the commissioning ceremony was held on 29 July 2020, when the ship became HMNZS *Aotearoa*.

MSC PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Maritime Sustainment Capability project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	498,512	24,095	522,607
	Allowance for foreign exchange movements	26,832	-	26,832
	Original approved project budget	471,680	24,095	495,775
Forecast	Forecast total project cost	488,370	23,715	512,085
	Effect of foreign exchange movements	16,692	-	16,692
	Forecast cost using hedged rate	471,677	23,715	495,392
	Forecast project variance	3	380	383

DEVELOPMENTS POST 30 JUNE 2020

A 10-day handover period followed the ship's arrival at Devonport Naval base on 26 June 2020 and *Aotearoa* entered the fleet integration phase of development.

Hyundai Heavy Industries started the process of completing outstanding work that had not been able to be completed in South Korea due to COVID-19 travel restrictions.

International travel restrictions continue to affect some activities, however border control exceptions were granted for overseas technicians who were essential to the completion of remaining work. Following completion of quarantine requirements, they were able to be on-site.

Crew training continued, and the first capability was released to the RNZN following the successful embarking of fuel.

Interim operational release to the Navy is expected to be achieved in December 2020.

NETWORK ENABLED ARMY C4 (TRANCHE ONE)

Network Enabled Army (NEA) Tranche One is delivering 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.

NEA C4 IN THE CONTEXT OF THE NEA PROGRAMME

The Network Enabled Army (NEA) Programme is moving the Army's planning, intelligence, and communications functions to modern, interoperable, digital-based systems that will increase information sharing capabilities between deployed units and the Army's command structure.

It will deliver to Army and Special Operations Forces (SOF) command, control, communications and computers (C4), intelligence, surveillance and reconnaissance (ISR) capabilities. It will mean that commanders will be able to make decisions more quickly, based on detailed real-time information. They will be able to communicate effectively with units on operations, other Government agencies, and/or security partners, in New Zealand, the Pacific or further afield.

The programme is planned to be rolled out through four tranches of funding to 2025-26 and, currently within the NEA Programme, the first two tranches have been approved, providing funding for two Defence-led projects to deliver their agreed outcomes: NEA C4 and NEA ISR.

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.

Tranche One

NEA C4 is providing NZDF's land forces with systems, technology and infrastructure. This has included the major priority of establishing the

basic network architecture for the future NEA programme; a combination of hardware (servers, routers, long distance communications links) and software (such as a battle management system that enables all functions across the network), along with industry specialist support. The project has been establishing testing, experimentation and evaluation capabilities that are needed to enable hardware and software to be assessed prior to investing in it; ensuring it integrates with other NZDF systems and is compatible with our partners.

In April 2015 Cabinet approved capital funding of $106 million for Tranche One, and operating costs of $36.4 million approved to spend over the next four years.

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.

The Tranche One funded NEA C4 Project is equipping 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 Two

While Tranche One was underway the NEA Programme commenced the definition phase for Tranche Two. This second tranche of funding will enable continued delivery of Tranche One capability, include purchasing of more of the equipment delivered under the project. The second tranche of funding has also expanded the focus to identifying and delivering ISR capabilities.[8]

ACQUISITION PHASE

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

Delivery of the NEA C4 project funded by Tranche One comprises five related capability sets, which have been summarised below, under *Description of Acquisition Work*.

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.

In 2019 the Tranche One timeline was re-baselined, and is now approved to deliver its combined capability in the fourth quarter of 2021.

How Defence decided to acquire the Capability Solution

The range of five inter-linked capability sets are being delivered through a series of acquisitions. They were developed through the overarching 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

Integration, Testing, Training, Evaluation and Experimentation: This includes most of the programme services that support the overall development of NEA, such as testing and

[8] The approval of the Business Case for the second tranche of the Network Enabled Army Programme 2019 was announced in August 2019.

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 contract for construction of the new User Centre was signed with Southbase Construction in June 2019 and as at 30 June 2019 the earthworks for the new User Centre were underway 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 – was built at Trentham and opened in September 2018.

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 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.

In February 2019 a Framework Agreement was signed with GATR Technologies Inc for this work stream, with statements of work used to be used to define specific deliverables and/or services to be provided. Following this, a Statement of Work (SOW) was established for delivery of the Tranche One Tactical Network (TNet).

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:

- The IT systems (e.g. computers, displays and software required to access, manage and display the information carried across the CUBS).
- The operational and tactical core services that will provide a battle management system for use at the Task Group and Sub Unit Headquarters layer.
- The command post infrastructure, including shelters, generators, environmental management and furniture. As at 30 June 2019 the decision had been made for the Command Post Service Trailer to be delivered by a range of providers including Tidd Ross Todd for the trailers and Eniquest for the power generation.
- 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.

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) received on 29 May 2017 were evaluated. A Request for Proposals (RFP) process for the Core Radios has resulted in the engagement of the preferred respondent. In February 2019 a contract was signed with Harris Defence Australia for a new tactical communications network. Under the $40 million contract a network will be designed and delivered, with software, systems and a connecting 'family' of radio equipment that will include new portable radios for soldiers.

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$M)
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: contingency is held within the appropriation baseline and 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.

Operational Release was originally due for completion by July 2018, was re-baselined to 29 June 2020, and is now scheduled for completion in the fourth quarter of 2021.

SCHEDULE/TIMEFRAME PROGRESS

	Original estimate at Approval to Commit	30 June 2020 (Forecast/Actual)	Variation in acquisition phase (months)
Interim Operational Capability	-	June 2021 (Forecast)	-
Full Operational Capability	July 2018	December 2021 (Forecast)	41

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.
1 May 2019	41	Proposals received during the RFP process for MTCS had indicated this work stream would push the project timeframes out to July 2021. With the work stream underway, the date for achieving full operational capability has been revised to December 2021.

CAPABILITY INTEGRATION

Description of Capability Integration Phase

With the complexity of workstreams and multiple elements being acquired in NEA Tranche One alone, and this tranche being part of an incrementally introduced programme, an overarching Capability Integration Approach has been developed for the NEA Programme.

The Programme and project work streams within each tranche, are delivering capabilities that require a high level of ongoing integration due to the nature of the system and the long-term delivery approach.

The equipment and systems being acquired need to be integrated within the Programme to deliver specific capabilities as well as new capability from other projects; and legacy systems and platforms. So capability integration for NEA will not be a single one off process.

Status of the Capability Integration Plan

Within the Capability Integration Approach, plans have been developed for integrating the new capability into service under this Tranche with a range of acceptance and operational testing and evaluation proposed across the work streams between September 2019 and October 2021.

SCHEDULE OF CAPABILITY INTEGRATION

	Initial Forecast	30 June 2020 (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 capability integration complete	December 2017	From September 2017 these work streams were working to deliver capability against a single IOC and FOC milestone. Interim Operational Capability June 2021 (Forecast) Full Operational Capability December 2021 (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 capability integration	March 2018		N/A

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.

From September 2017 IOC and FOC dates for capability delivery under Tranche One were applied across all capability work streams, as IOC and FOC will be achieved when all work streams within the Tranche have been delivered.

The FOC date above remains as it was at 30 June 2019, amended from the 2018 edition, where it was June 2020. IOR has been adjusted from August to June 2021.

The adjustment of the FOC date for Tranche One was approved by the Defence Capability Governance Board, an internal body comprised of both Ministry of Defence and NZDF, at the time the Tranche Two Business Case was approved for submission to Cabinet.

Benefits Realisation

Full benefits realisation is forecast to be achieved in 2021.

OPERATIONAL CAPABILITY

Progress towards Delivery of Capability and Operational Requirements

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.

DURING THE 2019/20 YEAR

On 17 August 2019 the Government announced approval of the second tranche of funding for the Network Enabled Army Programme of $106 million from within NZDF baseline funding, will be rolled out over four years.

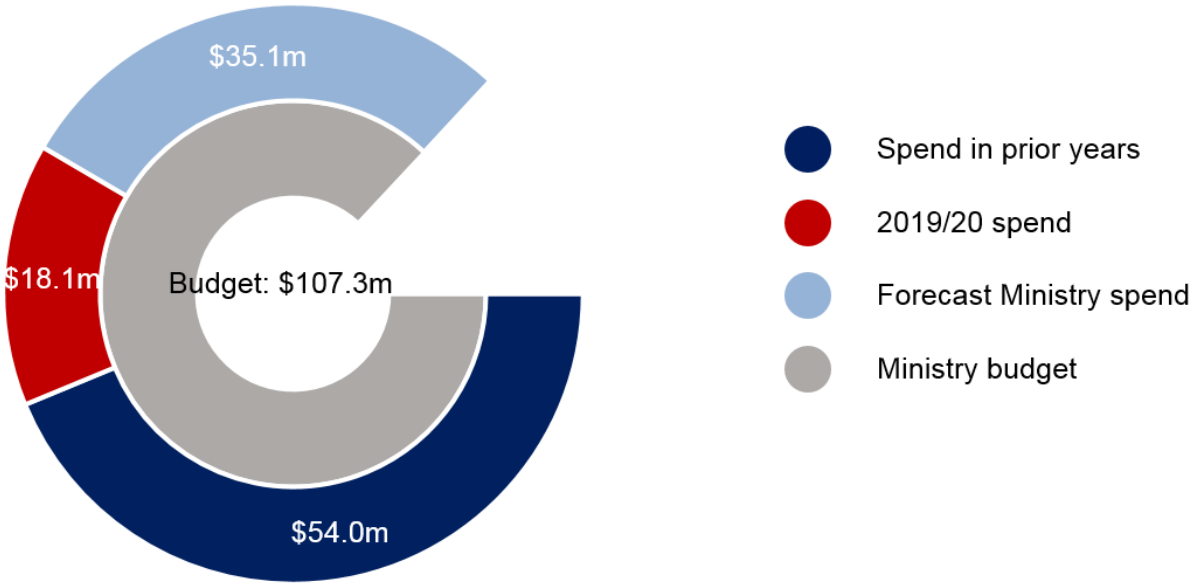
The C4 project has received part of the funding to complete the introduction of the capability that it is delivering. A second NEA project, which is being defined currently, is focused on expanding the capabilities to more units and personnel, and delivering enhanced intelligence, surveillance and reconnaissance capability.

The impact of COVID-19

At the end of March 2020 the Linton site, where the new user centre (the Capability Integration Centre) was under construction, closed in response to the declaration of COVID-19 Alert Level 4. The site remained closed to Southbase Construction staff until the country moved to Alert Level 3 in April.

The project noted delays were expected in some work streams, including testing and certification processes for some equipment, however teams were able to continue working remotely enabling statements of work to be approved and orders placed throughout the lockdown period.

NEA TRANCHE ONE PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Network Enabled Army project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	107,253	-	107,253
	Allowance for foreign exchange movements	1,253	-	1,253
	Original approved project budget	106,000	-	106,000
Forecast	Forecast total project cost	107,192	-	107,192
	Effect of foreign exchange movements	1,197	-	1,197
	Forecast cost using hedged rate	105,995	-	105,995
	Forecast project variance	5	-	5

DEVELOPMENTS POST 30 JUNE 2020

The new training and maintenance facility, the CIC, is nearing completion at Linton Military Camp. Handover of the new building was expected to take place in December 2020, when installation of equipment and furniture will commence.

The CIC will provide training for personnel on the range of systems being introduced into service under the Network Enabled Army programme, and provides a space for maintenance of equipment.

System and hardware design, testing and evaluation continued to advance.

NH90 SIMULATOR

This project seeks to increase the availability and sustainability of NH90 aircraft and crews for operational tasking by procuring a simulator, which will be located at RNZAF Base Ōhakea.

THE PURPOSE OF THIS PROJECT

This is the second project related to the delivery of the NH90 medium utility helicopter capability. The original project, which focused on the fleet acquisition, featured in the first seven editions of the *Major Projects Report*. The 2016 edition of the Report stated that all nine NH90 helicopters[9] had been delivered and that RNZAF-managed flying operations had been underway since February 2012.

The NH90 fleet replaced the Iroquois as the Air Force's major rotary wing aircraft capability, and provides logistical support, including troop transport and sustainment. It is capable of carrying far bigger loads, further and faster than the previous fleet.

However, the level of capability available to government from this fleet is limited by the number of NH90 pilots the NZDF can train and sustain. Training has been provided through a combination of NH90 flight hours in New Zealand, and the use of NH90 simulators in Germany and Australia. Simulators are used for training for situations that cannot be performed safely on the actual helicopter, such as engine failures, and to work through complex tactical scenarios. However, this training approach was recognised as not capable of generating and sustaining sufficient pilots to meet the level of capability required by government.

With no simulator available in New Zealand, crews and instructors had to travel overseas for this training, leaving a reduced number of pilots available to operate the aircraft. Having to train pilots extensively overseas also results in extra costs.

Increased simulation-based training is the most effective way of generating and sustaining sufficient pilots. Acquisition of a simulator to meet training needs has been included in Defence Capital Plans since 2009, however, NH90 simulators had not matured to the point where there was a competitive simulator market available. The emphasis was placed on completing NH90 development, getting support arrangements in place, and getting the fleet into service. With NH90 development completed, simulators are now commercially viable.

Three investment objectives were identified for this project:

- Ensure the Defence Force can produce and sustain a sufficient number of helicopter pilots capable of operating the NH90 to meet required outputs.
- Increase NH90 medium utility helicopter availability for NZDF operations and government agency tasks.
- Ensure NH90 simulator-based pilot training is resource efficient in terms of both crew availability and cost.

CAPABILITY REQUIREMENTS

RNZAF No. 3 Squadron operates eight NH90 helicopters at Ōhakea, with an overall planned output of 2,667 aircraft flying hours per year. It provides for:

- Three aircraft, available continuously for domestic tasks and training, including national contingencies.
- Three aircraft available for deployment overseas.

[9] Included one NH90 that was acquired and broken down to form the majority of the spares and logistics package.

- An additional two aircraft, which covers the fleet for scheduled or unscheduled maintenance.

This allows helicopters to be rotated through maintenance, and sustain the ongoing commitment of up to six aircraft at any given time. Missions include search and rescue, support for Police and counter-terrorism, Government transport, evacuation, disaster relief, and operational support for military tasks including supporting partners. Two helicopters are always available at short notice to support urgent tasks in New Zealand.

When the Squadron gets to full strength, it is planned to have 12 crews. Sustaining this number of crews requires 29 qualified NH90 pilots, but achieving and sustaining that number requires a different approach to training. Greater and easier access to simulation is needed.

The NZDF had a number of over-arching requirements for the NH90 Simulator:

- A solution in place by 2019.
- A minimum of 1500 hours of simulator use per year over 25 years.
- The simulator provider to have all necessary agreements with NATO Helicopter Industries, allowing for the simulator configuration to be updated to remain comparable with the New Zealand NH90 aircraft as it is modified over time.
- The simulator to be European Aviation Safety Agency certified to a minimum of CS-FSTD(H) Flight Training Device Level 3, with documentation delivered that is required for the NZDF to award a Permit To Operate.
- A simulator that replicates the New Zealand version of the NH90 helicopter closely.
- An assessment of the training activities that can be conducted on the simulator in order to gain training credits.
- The simulator contractor to conduct logistics support activities in accordance with a framework acceptable to the NZDF Airworthiness Authority.
- The simulation of a variety of training components, including emergency scenarios.

NH90 SIMULATOR BETTER BUSINESS CASE MILESTONES

2016	
2 February	**Project Charter approved** by Secretary of Defence, and Chief of Defence Force.
2017	
10 July	Cabinet approval to **issue a tender and delegate financial approval to Joint Ministers** (Finance and Defence)
2018	
25 July	Approval to **Commit to Contract** by Joint Ministers (Finance and Defence)

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability requirements

In late 2016 the project worked with key stakeholders to gain a better understanding of investment drivers and the need to invest in change. Through an Investment Logic Mapping exercise, it was determined that changes to the simulation-based training regime were required.

By the end of that year a wide range of options had been generated and a long list of in-scope options developed under five dimensions.

a. Scale: what levels of coverage are possible?

b. Location: Where can services be provided?

c. Ownership: How can government acquire services?

d. Service solution: How can services be provided?

e. Funding: How can services be funded?

The long-list options in each of the dimensions were assessed against critical success factors,

and a short-list developed. The following options were carried forward:

- **Option 0: Status quo.** NH90 pilots continue to travel to Europe and Australia to conduct the minimum required of simulation-based training.
- **Option 1: Increased use of Australian simulators.** NH90 pilots continue to travel to Europe for simulation-based conversion training, but qualified NH90 pilots conduct increased simulation-based training in Australia.
- **Option 2: Purchase of a New Zealand-based simulator.** NH90 pilots conduct the maximum amount of simulation-based training in a Defence purchased simulator located at Base Ōhakea.
- **Option 3: Lease of a New Zealand-based simulator.** NH90 pilots conduct the maximum amount of simulation-based training in a simulator leased by Defence located at Base Ōhakea.

How Defence analysed the requirements options in the Capability Definition phase

The ability of each short-list option to meet the project's goals was assessed. The major benefits assessed were the abilities to:

- enable Defence to raise and sustain 29 pilots for 12 NH90 crews
- increase the NH90 flying hours available for tasking
- have NH90 pilots available at Base Ōhakea for tasking
- maximise instructor availability at Base Ōhakea.

Each short-listed option was assessed as to whether it met the desired investment objective, then compared to whole-of-life-cost.

How Defence considered interoperability

Interoperability of the simulator with other aircraft and tactical simulators was considered and assessed in the tender, however was not a key consideration of this project. Integration of the simulator with the current NH90 helicopter mission planning system was a key outcome of the project.

How Defence considered through-life costs and issues

Payment to the supplier would be made in instalments, as milestones around production, testing, acceptance and delivery were achieved. The main change to operating expenditure would be adoption of a through life support agreement with CAE New Zealand, an additional expense offset by an annual saving in costs related to overseas simulator use.

REQUIREMENTS ANALYSIS IN THE CAPABILITY DEFINITION PHASE

	Option 0: Status quo	Option 1: Increased overseas simulation	Option 2: Purchase NZ simulation	Option 3: Leased NZ simulation
Total Pilot Training Whole of Life Cost (NPV) (NZ$M)	577.5	444.6	317.2	330.3
Increases NH90 availability	X	O	O	O
Produces sufficient NH90 pilots	X	X	O	O
Resource efficient	X	X	O	O
Conclusion	***Eliminate***	***Eliminate***	***Preferred***	***Not Preferred***

Option 2 'procure a New Zealand based simulator' was preferred as it meets all investment objectives at the best value for money of the short-list options. Option 2:

- enables Defence to sustain 29 NH90 pilots, allowing for a sustained international deployment of NH90 aircraft while concurrently maintaining the ability to respond to contingencies in New Zealand.
- is resource efficient as it increases the actual availability of NH90 pilots, particularly instructors, at Ōhakea by eliminating the need to travel abroad frequently to access simulators.
- releases aircraft hours for performing tasks through increased use of simulation-based training.

While Option 3 also offers similar benefits as Option 2, it does so at a higher whole of life cost, and is therefore not the preferred option.

Description of the Capability Requirements

Capability Requirements necessary to support policy objectives include:
1. Increase NH90 medium helicopter availability for NZDF operations and Government agency tasks
2. Ensure the Defence Force can produce and sustain a sufficient number of helicopter pilots capable of operating the NH90 to meet required outputs
3. Ensure NH90 simulator-based pilot training is resource efficient in terms of both crew availability and cost.

Schedule of Capability Definition Phase

Dates	Duration	Note
Feb 2016		Project Charter
Feb 2016 – July 2017	17 months	NH90 Sim Project Charter to SSBC (approval to issue request for tender)
July 2017 – July 2018	12 months	Request for tender to approval of PIBC (approval to commit to contract)

History of Cost Estimates in the Capability Definition Phase

Date	2017	2018
Costs (million)	42.4	42.7
Explanation	The Single Stage Business Case in 2017 estimated the cost of the project at $42.4M (including $4M project contingency and $4.4M FX contingency.	

Estimates of Acceptance Date made in the Capability Definition Phase

The Single Stage Business Case estimated the Operational Release (Acceptance) of the simulator as Q1 of 2020.

ACQUISITION PHASE

Description of acquisition work

In July 2017 Cabinet gave approval to issue a tender. The procurement strategy was to hold an open competitive tender for the provision of an NH90 pilot training simulator under a purchase contract.

How Defence decided to acquire the Capability Solution

A Request for Tender was issued on the Government Electronic Tenders Service (GETS) on 19 July 2017. Participants were provided with

tender documents, including a draft procurement contract prepared by Defence.

Five tenders were received by the September 2017 deadline. All proposed a newly built simulator.

The tender evaluation was conducted in three phases in October 2017:

- overall check that each tender was compliant with the request for tender
- detailed evaluation of each tender
- comparison and ranking of tenders.

Four of five tenders were found to be compliant with the basic tender requirements and were carried forward to phase two.

In Phase two, specialist working groups scored each tender against requirements on technical and logistics aspects, and commercial risk. These scores were weighted and combined to give an overall weighted non-financial score.

In Phase three, the Tender Evaluation Management Group reviewed the specialist working group assessments and compared tenders to provide a value for money recommendation. Three tenders were subsequently down selected for additional due diligence information gathering.

Due diligence visits were conducted during November 2017, based on questions and additional information requirements raised during the second and third phases. The information received from the due diligence visits was the basis to making a final recommendation to the Defence Acquisition Review Board which approved the project team's recommendation of the Canadian-based company CAE as preferred tenderer, and directed that initial negotiations commence in January 2018.

Contract Status (as at 30 June 2020):

Prime contractor	CAE, Montreal, Canada

SCHEDULE/TIMEFRAME PROGRESS

	Original forecast at Approval to Commit	30 June 2020 (Forecast/Actual)	Variation (months)
Contract signed	August 2018	July 2018 (Actual)	-1
Completion of Detailed Design Review	April 2019	December 2018 (Actual)	-4
Handover to Test	May 2019	March 2019 (Actual)	-2
Handover to Integration	June 2019	May 2019 (Actual)	-1
Completion of In-House Acceptance Testing	November 2019	February 2020 (Actual)	3
Facility Readiness[10]	November 2019	November 2019 (Actual)	0
Completion of In-Field Testing	June 2020	August 2020 (Forecast)	2
Ready for Training (Acceptance)	July 2020	September 2020	2

[10] A new building to house the NH90 simulator is a project deliverable.

Initial schedule estimates were made at the time the Project Implementation Business Case was submitted. At the time the contract was awarded, dates were firmed up as much as possible prior to completion of preliminary and detailed designs.

In-House Acceptance Testing (IHAT) was completed three months after the initial estimated date following notification by CAE that the simulator it was not ready to commence testing. IHAT was completed in February 2020 and the simulator was shipped to New Zealand for installation, arriving in May 2020. Travel restrictions in place due to COVID-19 prevented CAE's installation team from travelling to New Zealand. Defence personnel, local CAE staff and a virtual team of offshore CAE staff completed the installation process in July 2020, The Ready For Training date noted is when the simulator receives certification as a Flight Training Device. This date is dependent on a number of factors including international travel restrictions.

NH90 SIMULATOR CAPABILITY INTEGRATION PHASE

Description of Capability Integration Phase

A Capability Integration Plan (CIP) was approved in June 2019 and was developed to identify and schedule the tasks and activities, including the qualification processes required to bring the NH90 Simulator into operational service. It records the process that will see the NH90 Simulator transition from the delivery phase to being in-service.

Schedule of Capability Integration

	Initial Estimate	30 June 2020 Forecast/Actual	Variance (months)
Initial Operational Capability	May 2020	July 2020 (Forecast)	2
Operational Release	July 2020	July 2020 (Forecast)	0
Full Benefits Realisation	2028	2028	0
Delays in completion of In-House Acceptance Testing, led to a delay in the forecast date for achieving IOR.			

NH90 SIMULATOR OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements as at 30 June 2020

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

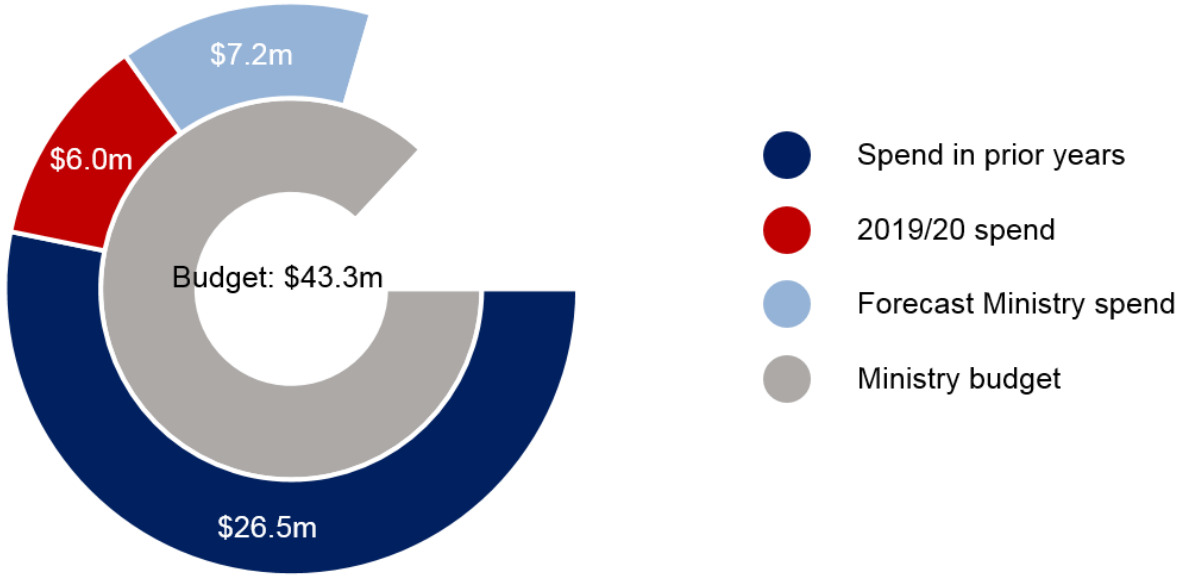
Operational Requirements	Requirement likely to be met	Comment
• NH90 flight training device • High fidelity training system qualified (as a minimum) as an EASA CS-FSTD(H) level 3 device with Level D Visual Display system.	Yes	Contracted with CAE

Operational Requirements	Requirement likely to be met	Comment
• Separate On board and off Board Instructor operating Stations	Yes	Contracted with CAE
• Mission Planning System	Yes	Contracted with Airbus Helicopter
• Tactical Scenario Generating System	Yes	Contracted with CAE
• Initial operating and maintenance/support training	Yes	Contracted with CAE
• Delivery of a facility to house, operate and support the simulator at RNZAF Base Ōhakea	Yes	Build underway
• NH90 Flight Training Device logistics support agreement (supporting the capability throughout its service life)	Yes	Contracted with CAE
Benefits realisation is scheduled for full implementation by December 2028.		

DURING THE 2019/20 YEAR

- The project had been progressing to schedule when, in September 2019, CAE advised a six-week delay to the simulator's In House Acceptance Testing (IHAT) dates. During this time it was expected that the simulator would be made ready for the test to be run. When the IHAT activity took place in November 2019 it became evident that further work was required.
- IHAT was completed successfully in February 2020, and Defence authorised CAE to power down the simulator and prepare it for shipment to New Zealand. Variations to other project milestones were identified, such as completion of in-field testing, which was planned to be conducted at the new facility at RNZAF Base Ōhakea in October 2020, and the final Ready For Training date.
- A further delay to the Ready for Training date was confirmed in April 2020, as a result of international travel restrictions expected to affect both Canada and New Zealand as a result of the COVID-19 pandemic. While the simulator arrived in New Zealand on 1 May 2020, and installation commenced at Ōhakea on 11 May, rather than being undertaken by a team of engineers from this work was undertaken by a small team of local installers, with virtual engineering support supplied by CAE Canada.

NH90 SIMULATOR PROJECT BUDGET AND EXENDITURE



At 30 June 2020 expected NH90 Flight Simulator project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	43,344	-	43,344
	Allowance for foreign exchange movements	608	-	608
	Original approved project budget	42,736	-	42,736
Forecast	Forecast total project cost	39,637	-	39,637
	Effect of foreign exchange movements	381	-	381
	Forecast cost using hedged rate	39,255	-	39,255
	Forecast project variance	3,481	-	3,481

DEVELOPMENTS POST 30 JUNE 2020

Installation was completed at Base Ōhakea at the end of July 2020 and the simulator was powered up for the first time. Initial in-field testing began in August and validation was completed 7 October.

The simulator was handed over to the Royal New Zealand Air Force on 9 October and interim training of pilots began on 12 October 2020.

OPERATIONAL AND REGULATORY AVIATION COMPLIANCE SUSTAINMENT PHASE ONE

The primary objective of the Operational and Regulatory Aviation Compliance Sustainment (ORACS) Project – Phase One, is to deliver platform-based capabilities that sustain effective, safe and secure air operations in response to a changing technological and regulatory aviation environment

THE PURPOSE OF THIS PROJECT

The Operational and Regulatory Aviation Compliance Sustainment (ORACS) Project is designed to sustain the New Zealand Defence Force's ability to conduct air operations by complying with updated aviation regulations and addressing obsolescence. This will be done by updating various systems on board NZDF aircraft in line with global regulations and modernised technologies.

The project will be carried out in two phases. Phase One encompasses civil air traffic management systems for most aircraft. Phase Two encompasses navigation and communication systems.

Civil air traffic management

Air traffic management in controlled airspace is moving to a new technology called Automatic Dependant Surveillance – Broadcast (ADS-B) Out. This requires aircraft to continuously broadcast their GPS position, identity and status information, allowing ground controllers to track the aircraft more precisely and efficiently than current RADAR systems. ADS-B Out therefore results in more efficient air traffic management which means better flight times, lower fuel usage and less environmental impact. For ADS-B Out to be effective, all aircraft must have this system installed and operational. In New Zealand, the deadline was 31 December 2018 for flights above flight level 245 and is 31 December 2021 for controlled airspace. As a result, many aviation authorities around the world are requiring all aircraft have ADS B Out capability to fly in their controlled airspace.

CAPABILITY REQUIREMENTS

The ORACS high level user requirements are:

1. Communications, navigation and surveillance capabilities that enable safe, efficient, compliant and unrestricted flying operations in civil controlled airspace, in order to deploy NZDF capability globally in support of New Zealand government policy objectives.
2. Communications, navigation and surveillance capabilities that enable safe, efficient, compliant and unrestricted military exercise and operational flying in order to deploy NZDF capability globally in support of New Zealand government policy objectives.
3. Communications capabilities that enable NZDF aircraft to securely receive and disseminate information with NZDF, Coalition and Other Government Agencies, in order to exercise and operate with defence partners in support of NZ government policy objectives.
4. Communications, navigation and surveillance capabilities that achieve the directed States of Readiness for operations, in order to meet anticipated flying requirements for the Government of New Zealand.
5. The ability to sustain communications, navigation and surveillance capabilities for NZDF aircraft fleets, in order to meet anticipated flying requirements for the Government of New Zealand.

The overarching user requirements for ORACS include:

- Compliance with all appropriate operational and technical standards
- Proven non-developmental low risk solutions
- Economy of operation and ownership
- Autonomy and freedom from operational restrictions imposed by third parties.

In addition, ADS-B Out solutions must comply with the equipage requirements of the regions/states the affected platform is likely to operate within, based on the relevant Concept of Employment and Statement of Operating Intent.

ORACS BETTER BUSINESS CASE MILESTONES

2019	
15 April	Cabinet approval of **Single Stage Business Case** CAB-19-MIN-0171

CAPABILITY DEFINITION PHASE

How Defence identified and assessed capability and operational requirements

Because the need for change has been driven by compliance regulations and obsolescence of current systems, the possible options and the ways in which they are assessed were largely dictated by these changes. Therefore, the range of variables that would typically be considered was significantly decreased.

For example, ADS-B Out and military communications equipment effectively become a permanent and integral part of the aircraft, so realistically the ownership should be the same as the aircraft in which it is installed (i.e. if the aircraft is owned, the specific compliance equipment should also be owned, as it is not feasible to de-link from the aircraft in the future).

Similarly, it is best installed and maintained through the same support arrangements as the rest of the aircraft.

The key variables when assessing the long list options therefore become scale and timing:

Variable	Description	Options within each variable
Scale	What capability systems should be provided by the project?	ADS-B Out and/or military communications and/or Secure Communications and/or Performance Based Navigation
Timing	When should capabilities be delivered?	Immediate priority or do later

Both of these variables were looked at fleet-by-fleet, and assessed against the critical success factors, which are: strategic fit, value, supplier capacity, affordability, achievability.

From the Long List Options Assessment, the following short-list options were identified for further investigation:

Option 0: Status quo. Platforms continue to use current systems, with no action taken to address regulatory mandates or issues of obsolescence.

Option 1: Immediate priorities only, now. The immediate priorities for each platform are acted on as soon as possible, but the remaining capabilities are not addressed.

Option 2: Immediate priorities now, other priorities phased. The immediate priorities for each platform are acted on as soon as possible, and the remaining capabilities still deemed priorities for each platform are addressed at a later stage with a separate business case.

Preferred Option

'Option 0: status quo' was eliminated as it did not meet the critical success factors or the project's intended benefits/investment objectives.

Option 0:

- Did not enable NZDF to maintain the ability to conduct air operations such as aircrew training and whole of Government support in civil airspace. As such, Defence would be unable to deliver key outcomes to government.
- Did not enable NZDF to maintain the ability to conduct air operations in military airspace such as movement of people and assets to support Government outputs.

Option 1: Immediate priorities only, now: was also eliminated. As with Option 0, it did not meet some of the critical success factors and only met one of the two key investment objectives.
Option 1:

- Did not enable NZDF to maintain the ability to conduct air operations in military airspace with secure communications.
- Did not enable NZDF to maintain the ability to conduct air operations in civil airspace with sufficient navigation systems.

Option 2: Immediate priorities now, other priorities phased: was the preferred option, as it met all investment objectives at the best value for money of the short-list options. Option 2:

- Enables NZDF to maintain the ability to conduct air operations in civil airspace.
- Enables NZDF to maintain the ability to conduct air operations in military airspace.

How Defence analysed the requirements options in the Capability Definition phase

In general, there are two ways to achieve upgraded solutions: off-the-shelf or custom design. An off-the-shelf solution will generally be the lower risk option; however, they often rely on the aircraft to be of a common configuration. As most of the NZDF's aircraft are bespoke they fall outside this category and require a custom design.

Alongside the fleet wide commonalities such as airworthiness certification by the RNZAF, there are three somewhat distinct elements to be considered when forming the procurement strategy:

- Selecting and acquiring the hardware.
- Design, integration and installation onto the first of each aircraft type and support of the airworthiness certification of the capability.
- Subsequent remaining fleet installation.

For some fleets, in order to match existing equipment, the hardware to be fitted to the aircraft will be a combination of an updated version of the current transponders and corresponding equipment that offers ADS-B Out capability. Direct sourcing this hardware is appropriate as there is no reasonable technical alternative and therefore no viable competition, removing the requirement to openly advertise a tender.

For some fleets, in-house RNZAF engineering services will design, integrate, install the first prototype and complete the airworthiness certification of the systems. This lessens the complexity, risk and schedule – reducing overall cost.

For other fleets, the avionics software system is both bespoke and highly integrated. The systems are supported by Through Life Support contracts with industry, who will be further contracted to design, integrate, and work with NZDF who will manage the installation of the prototype and complete the airworthiness certification of the systems. Therefore although the system IP is owned by NZDF, a competitive approach to market seeking an alternative supplier would be difficult if not impossible.

How Defence considered interoperability

A key assumption of the ORACS project is that the New Zealand Government wishes to align NZDF capabilities, from an interoperability perspective, with those of Australia, the US Department of Defense, CANZUS, and NATO member states.

This will sustain effective, safe and secure air operations, and maintain interoperability with partners.

How Defence considered through-life costs and issues

The estimated whole of life costs were based on maintained ability to conduct air operations in civil and military airspace.

- As per the accounting standards reflected in Defence Force Order 77, standard avionic equipment depreciation will be assessed at 15 years.
- Cost estimates for the Phase One work stream were based on price estimates gathered from multiple suppliers, including defence industry, which were received during 2017 and 2018.
- Estimation of capability integration, project management costs and personnel costs was based on the project team's estimates of activities, duration, capability, and resource requirements.
- Forecast operating expenditure covers the estimated useful life of the respective capital investments and includes through life operating costs for repairs and maintenance.
- Costs have been converted into NZD based on: The Treasury's New Zealand Debt Management forward exchange rate profiles for the Australian dollar, the Euro, and US dollars that were also being used for Defence Capital Plan Refresh 2019.
- Costs were inflated using Defence White Paper 2016 inflation rates.

SCHEDULE/TIMEFRAME PROGRESS

	Original forecast at Approval to Commit	30 June 2020 forecast/achieved	Variation (months)
T6-C ADS-B acceptance on first aircraft	March 2020	February 2021 (forecast)	+11
T6-C ADS-B operational release	January 2021	May 2021 (forecast)	+4
The variance does not extend past the mandated ADS-B date of January 2022 in New Zealand.			

ACQUISITION PHASE

Description of acquisition work

On 15 April 2019 Cabinet confirmed GOV-19-MIN-0014 which authorised the Secretary of Defence to commit and approve expenditure up to the amount of $56.832 million for Phase One systems, for most NZDF aircraft fleets.

How Defence decided to acquire the Capability Solution

In order to match existing equipment, the hardware to be fitted to most of the aircraft was direct sourced as a combination of updated versions of the current transponders and corresponding equipment. To install the equipment to the aircraft, existing maintenance and logistics support agreements were utilised.

For the T-6C fleet, for example, the solution offered by Textron Aviation Defense was a proven ADS-B solution providing the best balance between the least risk and best value for money. Therefore, a direct source to Textron as the supplier for all elements of the procurement; hardware, design, integration and installation went ahead.

Contract Status (as at 30 June 2020):

Prime contractor for T-6C fleet	Textron Aviation Defense

ORACS CAPABILITY INTEGRATION PHASE

Description of Capability Integration Phase

Following the first of type installation and certification of the ORACS systems, the installation for each aircraft will be actioned as they are scheduled for either a group or phase maintenance activity – unless an early deployment or commitment dictates otherwise.

Once each entire fleet's platforms have completed the installation and flight test required for certification then that fleet will be deemed to have obtained Operational Release. For the T-6C, for example, this will be declared once the fleet is certified ABS-B Out compliant.

ORACS OPERATIONAL CAPABILITY

Progress towards Delivery of Operational Requirements as at 30 June 2020

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

Operational Requirements	Requirement likely to be met
Improved capabilities that sustain safe, efficient, compliant and unrestricted flying operations in civil controlled airspace, in order to deploy NZDF capability globally in support of NZ government policy objectives.	Yes. Both globally and in New Zealand, NZDF aircraft fly in civil controlled airspace alongside other air traffic. To safely carry out their tasks in this airspace, the aircraft must be equipped with the appropriate systems which must comply with regulations and remain in-step with modern technologies. Modifications on all affected fleets are either underway or are planned.
Improved capabilities that sustain safe, efficient, compliant and unrestricted military exercise and operational flying in order to deploy NZDF capability globally in support of NZ government policy objectives.	Yes. Systems are implemented
Full benefits realisation for all Phase One fleets is scheduled to be achieved before the ADS-B mandate of 2022.	

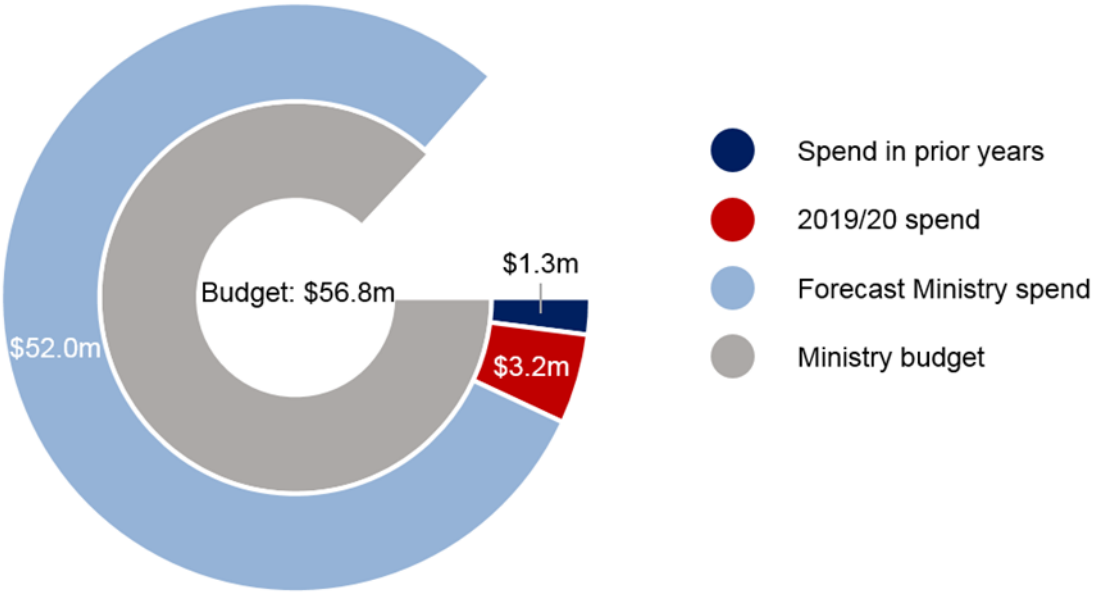
DURING THE 2019/20 YEAR

A plan was developed for installing the new systems into the range of Defence Force aircraft.

The impact of COVID-19

The project was engaged with a range of industry providers for design and costings for the upgrades of other aircraft when the COVID-19 pandemic began to affect operations around the world.

ORACS PHASE ONE PROJECT BUDGET AND EXPENDITURE



At 30 June 2020 expected Operational and Regulatory Aviation Compliance Sustainment: Phase One project costs were:

		Ministry	NZDF	Consolidated project
		$000	$000	$000
Budget	Current approved project budget	56,832	-	56,832
	Allowance for foreign exchange movements	-	-	-
	Original approved project budget	56,832	-	56,832
Forecast	Forecast total project cost	56,540	-	56,540
	Effect of foreign exchange movements	(183)	-	(183)
	Forecast cost using hedged rate	56,723	-	56,723
	Forecast project variance	109	-	109

DEVELOPMENTS POST 30 JUNE 2020

The project continues to work on delivering the systems into the fleets.

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 commence 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 will be delivered.

The capability integration 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

- **Capability:** in the Defence Capability Management System this refers to not only equipment, but also the people who operate it, their training, technical systems, and management and support structures. These components make up the PRICIE construct which is used by Defence to determine the fundamental inputs to capability. (See below.)
- **Capability Integration Plans:** Capability Integration Plans (CIP) are single cohesive plans that pull together all of the planning and activities that need to be undertaken by the project, the owners of the capability and those who are working with Defence to ensure the capability is integrated. These groups work from and contribute to this plan and each CIP is a living document that is updated regularly.
- **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.
- **Interoperable:** the ability of military forces to work alongside civil agencies and other nations' militaries through having compatible doctrine, equipment and training, as well as the compatibility of communications and command and control systems.
- **Multi-Criteria Decision Analysis (MCDA):** an analytical method that compares options using weighted benefit, risk and cost criteria. It is used for prioritisation and options analysis, particularly in support of business cases.
- **Operational Release/Full Operational Capability:** the point at which the capability system has proven to be effective, safe and suitable for its intended roles and, in all respects, is ready for operational service.
- **PRICIE:** an acronym for the elements used to determine the fundamental inputs to capability: Personnel; Research and Development; Infrastructure and Organisation; Concepts and Collective Training; Information Technology; Equipment, Logistics and Resources.

OTHER TERMS

- Rotables: aircraft parts or components that are able to be rebuilt of overhauled (in-house or by a vendor) and put back in stock to use again. Rotables are basically the opposite of expendable or throw-away parts.