




MAJOR PROJECTS REPORT 2016

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PART 4A: PROJECT DATA SHEETS[1]

[1] This section discusses how Defence considered interoperability. NATO broadly defines interoperability as: “the ability to act together coherently, effectively and efficiently to achieve tactical, operational and strategic objectives”.

Specifically, Military interoperability is defined as: “The ability of military forces to train, exercise and operate effectively together in the execution of assigned missions and tasks.”

There are three key dimensions to interoperability: technical, procedural and human.

Technical interoperability consists of hardware and systems. It is the ability of systems to provide information and services to, and accept information and services from, other systems, and to use the information and services so exchanged.

Procedural and doctrinal interoperability is the ability of joint and combined forces to work together on military operations toward the achievement of common objectives. Both are enabled through the formulation of appropriate doctrine, procedures and the undertaking of the necessary training.

Human interoperability is using a common language, understanding different cultures and training together. To achieve this form of interoperability is one of the key reasons military forces train with friendly military forces. It generates professional trust and confidence.

C-130H LIFE EXTENSION

Project Description: This project is extending the life and availability of the five RNZAF C-130H Hercules aircraft for airlift and transport tasks through to at least 2020. This is being achieved by upgrading the avionics, flight deck communications, navigation, mechanical and self-protection systems as well as extensively refurbishing the airframe structure. The project is also procuring a part task trainer to assist pilot conversion training.

Policy Value

The C-130H provides essential air transport and airlift that enhances the Government's options for:

- defending New Zealand's sovereignty, its Exclusive Economic Zone and territorial waters;
- conducting operations to combat terrorism or acts of sabotage;
- 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 and abroad in resource protection, disaster relief, and humanitarian assistance; and
- participating in Five Power Defence Arrangements and other multilateral exercises or operations.

Government Approval Milestones[2]

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 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.

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

Date	Approved By	Approval
2 April 2001	Cabinet CAB Min (01) 10/10	**Project initiation.** The NZDF's Sustainable Capability Plan assessed the retention of a strategic and tactical airlift and air transport capability as a high priority. A Fixed Wing Transport Review was undertaken to identify options and a technical study was carried out to assess the feasibility of extending the life of the C-130H.
18 November 2002	Cabinet CAB Min (02) 31/6	**Approval to Initiate.** Cabinet approved the Review's recommendation to initiate a project based on a 15 year life extension of the C-130H. Cabinet authorised MoD to engage with industry.
6 October 2004	Cabinet CAB Min (04) 23/5	**Approval to Negotiate.** Defence was authorised to carry out negotiations with L3-Spar. Note: The Cabinet Paper was titled 'Approval to Proceed'.
6 December 2004	Cabinet CAB Min (04) 40/11	**Approval to Commit.** Contract signed with L3 Spar Aerospace.
19 April 2007	Cabinet CAB Min (07) 12/7	**Approval of Contract Variation.** Cabinet approved a change to the contract to upgrade the C-130H's self-protection system (SPS).
28 July 2010	Cabinet EGI Min (10) 17/8	**Approval of Additional Funding.** Cabinet approved additional funding for the proposed solution for completion of the production phase.

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

In 2000 Defence began formally considering options for maintaining its tactical air transport capability. An initial study was commenced in 2000 to examine the feasibility and likely costs of extending the life of the existing C-130H fleet. The feasibility study identified that an upgrade must address:

- the preservation of the airframe's structural airworthiness;

- the ongoing support of the mechanical and avionics systems; and
- the need to meet evolving communications and navigation requirements.

In March/April 2001, Cabinet agreed that the NZDF's airlift and air transport capabilities should be retained.

In November 2001, a contract was signed with Marshall Aerospace of the United Kingdom to carry out a Life of Type study for the C-130H. The study was designed to identify the extent of refurbishment and technical modifications that the C-130H fleet would need if its life was to be extended. In addition to the Life of Type study, several options for retaining the capability were assessed.

Following the Life of Type study a Policy and Capability Review of the Royal New Zealand Air Force Fixed Wing Transport Fleet confirmed the policy roles and operational tasks of the fleet. The review also analysed the option to purchase the C-130J Hercules as part of Australian Defence Force's purchase of the type, and compared this with the benefits of extending the life of the C-130H fleet.

The capability project team then prepared and released an Operational Concept Document in June 2003. This document identified the key operational requirements necessary to support defined tactical tasks such as in theatre transport of troops or emergency medical evacuation. The operational requirements included, among others, tactical airlift, modern avionics systems, and enhanced self-protection systems.

How Defence analysed the requirements options in the Capability Definition phase

It was determined that, aside from the C-130H and the C-130J, there were no other aircraft that could provide the specified operational requirements. The two principal options that were looked at included:

- purchasing up to eight C-130Js alongside the Australian Defence Force; or
- extending the life of the current C-130H fleet by significantly refurbishing and upgrading the fleet.

A 2002 Joint User Group identified many risks associated with the C-130J option. The risks included:

- operating issues with the airframe, and communication and navigation systems that were inhibiting its introduction into service in other air forces;
- a high acquisition cost (totalling $1-1.2 billion); and
- potentially high support costs when compared to the C-130H fleet.

The analysis concluded that it was feasible and economical to extend the life of the C-130H fleet out to 2017. This option also gave Defence more time to identify a suitable replacement aircraft. A November 2013 "Life of Type" Study revised the life of the C-130H fleet to at least 2020. Cabinet agreed on 18 November 2002 that New Zealand would not purchase new C-130J aircraft and authorised the Minister of Defence to seek proposals to upgrade the C-130H aircraft.

How Defence considered interoperability[3]

To achieve the Government's policy objectives, the NZDF had to be able to operate with the Australian Defence Force and other key Defence partners. The NZDF also needed to be able to operate in coalition with other key defence partners across the Asia-Pacific region. Both options were expected to meet these requirements.

[3] For definition of interoperability see note under *Part 4A: Project Data Sheets.*

How Defence considered through-life costs and issues

In Defence's view, the C-130H option offered lower risks in through-life support costs and potential issues related to the aircrafts' operation. Planning for through-life costs and known issues could largely be carried over from the old fleet. Many of the operational and maintenance issues that the C-130H had been experiencing had yet to be resolved by those operating the aircraft (including issues involving flight noise/vibration and limited availability of spare parts).

The Operational Support Document identified what the ongoing and new support requirements of the C-130H would be after the upgrade. New support requirements included reduced maintenance burden due to an increased time between component failures, and an increased need for software support.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare, assess, and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

Options assessed for delivering the C-130H LEP capability and operational requirements

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Extend the life of the C-130H	252	• Achievable at economic cost. • Best balance between return on investment and the risks involved with extending aircraft life further than 2017. • Provides time for Defence to identify a suitable replacement aircraft.	• Decreased aircraft availability during upgrade. • Life extended only to 2017.
Purchase new fleet of C-130J aircraft	Between 1000 and 1200	• New aircraft has a longer service life. • More efficient propulsion system.	• High cost. • High support costs due to software-intensive systems. • No certification for tactical operations at time of analysis. • Current non-compliance with changing regulations for air traffic management.
Lease new fleet of C-130J aircraft	Unknown	• As above.	• Given the potential life of 40 years, a lease was expected to be the most expensive option.
Purchase used C-130s	Unknown	• Operating and maintenance history is likely to be similar to that of the current fleet.	• Used aircraft could have been in similar or worse condition than current fleet. • Fatigue in aircraft would be difficult to predict.

Purchase another type, Antonov AN70 or the then yet to be built Airbus A400M	Unknown	• Unknown.	• Lack of maintenance and operations support available for the AN70. • A400M was not available immediately.

Description of the Capability and Operational Requirements

Capability Requirements – The capability requirements necessary to support policy objectives include:
The key capability requirements: • Provide tactical airlift operations (inter-theatre air transport) in moderate threat environments in support of NZDF deployments. • Conduct airlift operations as part of coalition task force in support of our Defence partners. • Conduct strategic airlift operations between New Zealand, the South Pacific, and the Asia Pacific. • Assist in delivery of vital civil military tasks.

Operational Requirements – The operational requirements necessary to support the capability include:

- Tactical airlift to allow flying operations or missions within a 'theatre of operations'. This requires the ability to fly covertly, reach low-altitude drop zones and land on short prepared and unprepared airfields.
- Strategic airlift to allow flying missions between New Zealand and a theatre of operations. This requires the capacity to travel medium to long distances at medium to high altitudes into prepared airfields using civilian air traffic regulations.
- A pre-mission planning system that can be used to prepare detailed flight plans that can be electronically transferred to an aircraft's mission system.
- Communications systems that comply with international air traffic regulations. They must also be able to stay connected to NZDF's Joint Force headquarters and operate securely alongside New Zealand's defence partners.
- Navigation systems designed to carry out tactical operations. This requires a high-resolution system allowing flying in high or low altitudes, in poor weather, and an ability to locate obscure airfields and drop zones. The navigation system also needs to comply with international air traffic regulations.
- Aircraft identification technology that distinguish the C-130H as a "friend" during in-theatre operations and prevent the C-130H from being targeted by friendly air and ground forces.
- A Self Protection System that allows can reduce the risk of being shot down by man portable air defence systems and allows operations in hostile environments.
- Search and Rescue only if other assets (such as P-3K Orion) were unavailable.

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

Schedule of Capability Definition Phase

Dates	Duration	Note
2 April 2001 to 6 December 2004	3.5 years before signing the contract	Definition work on the self-protection system continued after the contract was signed. Key RNZAF personnel were seconded to the Ministry of Defence's Acquisition Division to help with aligning operational requirements with the contractor's delivery of function and performance specifications.

Expenditure of Capability Definition/ Source Selection Phase

	Expenditure (NZ$)	
Life of Type Study		2.5 million
Definition phase	2002/03	2,768.51
	2003/04	177,002.66
	2004/05	24,275.12
	2006/07	3,137.66*
Explanation	During the definition phase, the above costs were classified as pre-acquisition costs and were met from the NZDF's operating budget. *This cost was shared with the P-3 Orion Upgrade project and was used for definition of the self-protection system upgrades.	

History of Cost Estimates in the Capability Definition Phase

Date	2002	2003	2004	Contract Signing – December 2004
Costs (NZ$ million)	100-170 320	100-170 100-150	100-170 100-150	233.7
Explanation of variance	Between July and December of 2004 cost estimates were refined because Defence had approached the market with requests for tenders and was under contract negotiations with L-3 Communications Spar Aerospace of Canada (L3-Spar).			

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	Estimate at Contract Signing	30 June 2016 Estimate / Actual
First aircraft delivery	2nd Quarter 2007	2007	Provisional acceptance of the prototype aircraft occurred in September 2010
Last aircraft delivery	3rd Quarter 2009	2010	September 2016
Explanation of variance	The first schedule was a low-confidence estimate published in the June 2003 Defence Long-Term Development Plan. It forecast aircraft acceptance to occur between 2006 and 2008. The closing down of the prime contractor part way through the programme meant all planned delivery dates were at risk against a new implementation plan.		

NH90 MEDIUM UTILITY HELICOPTER

Project Description: This project is providing the NZDF with a medium utility helicopter capability for the next 30 years. Eight NH90 helicopters with associated deliverables have been acquired from NH Industries to replace the Royal New Zealand Air Force Iroquois fleet. An additional (ninth) helicopter has been acquired and broken down to form the majority of the spares and logistics package.

Policy Value

The Medium Utility Helicopter (MUH) provides rotary wing airlift that enhances the Government's options for:

- defending New Zealand's sovereignty;
- conducting operations to combat terrorism or acts of sabotage;
- 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 and abroad in resource protection, disaster relief, and humanitarian assistance; and
- participating in Five Power Defence Arrangements and other multilateral operations.

Government Approval Milestones[4]

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 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.

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

Date	Approved By	Approval
2 April 2001	Cabinet CAB Min (01) 10/10	**Project initiation.** The NZDF's Sustainable Capability Plan recommended a study be completed to identify options for upgrading or replacing the Iroquois to provide a utility helicopter.
3 December 2003	Cabinet ERD Min (03) 14/9	**Approval to Initiate.** Cabinet agreed to a helicopter capability with a fleet mix of training and light utility helicopter and medium utility helicopter and authorised Ministry of Defence to engage with industry.
13 October 2004	Cabinet ERD Min (04) 11/3	**Approval to Commence.** Ministry of Defence authorised to conduct a due diligence process followed by the release of tender documentation to three short listed suppliers.
3 April 2006	Cabinet CAB Min (06) 11/2C	**Approval to Negotiate.** Ministry of Defence authorised to carry out negotiations with NH Industries.
17 July 2006	Cabinet CAB Min (06) 26/1A	**Approval to Commit.** Ministry of Defence authorised to enter into a contract with NH Industries for eight NH90 medium utility helicopters.

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

In 2001, a Defence team identified and analysed the capability and operational requirements for the NZDF's utility helicopter capability. The requirements to support other government agencies were included and the team aligned the identified requirements with government policy.

The definition phase included the requirements for training, light and medium utility helicopter tasks and roles. In the acquisition phase the project separated into two projects: one to purchase the medium utility helicopters and the other to purchase the training and light utility helicopters.

How Defence analysed the options

In 2003, the capability and operational requirements were assessed against two sets of potential options. The first set of options focussed on a mixed fleet of aircraft types and the second set of options considered a range of aircraft that were representative of the capabilities required. In December 2003, Cabinet noted that Defence had completed an initial analysis of helicopter capability requirements and agreed that the Ministry of Defence identify potential suppliers and seek further information on the capability, availability, price and supply of helicopters to meet those requirements.

The analysis of capability and operational requirements was agreed by the Single Services, HQ NZDF and the Ministry of Defence, and captured in a suite of capability requirement documents.

In October 2004 as part of Closer Defence Relations, New Zealand and Australian Defence Ministers agreed to discuss the practicalities of both countries acquiring the same brand of helicopter. In March 2005, Australia decided to acquire a variant of the NH90 helicopter (MRH90). Defence concluded it was beneficial for New Zealand to acquire a similar helicopter for cooperation on through-life support and training but that a joint purchase would not be financially advantageous for New Zealand.

How Defence considered interoperability[5]

Throughout the analysis of capability and operational requirements, the ability to operate with the Australian Defence Force was considered, as was compatibility with other Defence partners.

How Defence considered through-life costs and issues

In October 2003, Defence employed the United Kingdom Ministry of Defence's Price Forecasting Group to assess the initial costing information. The cost model used included whole of life costs that were made up of all acquisition, entry into service and operational costs for the life of the aircraft. While the cost model was based on the Price Forecasting Group databases and industry figures, it was noted that the costs were 'dynamic and could fluctuate in the model outcomes'.

[5] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare assess and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

Table One: Fleet Mix Options			
Options Considered	**Advantages**	**Disadvantages**	**Cost Estimate[6] (NZ$ million)**
Option 1 Like for Like	• Nil advantages.	• Limited payload capacity. • Inability to move an Army section in single move. • Unable to provide Special Forces with rapid tactical mobility for counter terrorism.	Not provided at that time
Option 2 One type of aircraft	• All capability requirements met. • Reduced logistical burden.	• A medium utility helicopter presents an unacceptable risk of accidents for pilot training. • Inefficient use of capability for light tasks. • Little opportunity for rapid and/or short deployment, for example, civilian support tasks.	Not provided at that time
Option 3 Three types of aircraft	• Provides operational flexibility.	• Large logistic burden to support three different aircraft.	Not provided at that time
Option 4 11 medium utility aircraft 4 Training aircraft	• Meets all key operational requirements.	• Insufficient training helicopters for deployable light utility capability and will create risk to concurrent tasks such as sniper use or troop transport. • Medium utility helicopter inefficiently used for light tasks. • No allowance made for attrition.	Capital 528-553
Option 5A 15 medium utility aircraft 8 training & light utility aircraft	• Meets all key operational requirements.	• Does not meet essential affordability or supportability requirements. • Capital and whole of life costs high. • No allowance made for attrition. • Personnel requirements exceed current establishment and would be difficult to generate.	Capital 658-684

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

Option 5B 9 medium utility aircraft 8 training & light utility aircraft	• Meets all key operational requirements.	• Risk to concurrent tasking and aircraft availability. • No allowance made for attrition.	Capital 464-503
Option 5C 10 medium utility aircraft 10 training & light utility aircraft	• Optimum mix to meet all key operational requirements. • Better concurrent tasking for contingencies such as disaster relief operations.	• No disadvantages noted. • No allowance made for attrition.	Capital 520-568
ASSESSMENT	Option 1 was discounted because it failed to meet operational requirements. Option 2 was discounted because it posed an unacceptable risk of accidents during pilot training. A large complicated helicopter is less responsive and harder to recover from adverse situations experienced during pilot training. Option 3 provided the operational flexibility but the costs for supporting three aircraft were considered too high due to a large logistics burden. Option 4 was considered an inefficient use of a medium utility helicopter for light tasks and the requirements for counter terrorist tasks were not met fully. Option 5A was considered too expensive. Option 5B was considered an acceptable solution because it met all the operational requirements, but it was noted that readiness could be compromised if concurrent tasks were required. Option 5C was considered the optimum solution because it met all key operational requirements.		

Table Two: Aircraft Options			
Aircraft Considered	**Advantage**	**Disadvantage**	**Cost (NZ$ million)**
Bell 412-EP	• Nil advantages.	• Failed to provide payload requirements.	Not assessed at that time
Agusta-Bell AB-139	• Nil advantages.	• Failed to provide payload requirements.	Not assessed at that time
Sikorsky UH-60 Blackhawk 15 aircraft	• Nil advantages.	• Require 15 aircraft to deliver payload requirements. • High operating costs.	Capital 606.2
Agusta-Westland EH-101 9 aircraft	• Exceeds all key operational requirements with the exception of the max external load capacity.	• Failed to meet the required external load capacity. • High acquisition and operating costs.	Capital 662
NH90 9 aircraft	• Meets all key operational requirements • Operating costs less than S/H-92.	• Acquisition costs higher than S/H-92.	Capital 426
NH90 10 aircraft	• Meets all key operational requirements. • Operating costs less than S/H-92. • Optimum numbers for concurrent tasks.	• Acquisition costs higher than S/H-92.	Capital 471
Sikorsky S/H-92 9 aircraft	• Meets all key operational requirements. • Lift capacity is greater than the NH90.	• Military variant likely to be more expensive. • Cabin design caused tactical concerns.	Capital 412
Sikorsky S/H-92 10 aircraft	• Meets all key operational requirements. • Lift capacity is greater than the NH90. • Optimum numbers for concurrent tasks.	• Military variant likely to be more expensive. • Cabin design caused tactical concerns.	Capital 456
ASSESSMENT	The NH90 and S/H-92 helicopters met all operational requirements and were considered comparable options in the project definition phase.		

Description of the Capability and Operational Requirements

Air Assault: Assault forces employ the helicopter in the battlespace to contain and engage enemy forces.

Air Movement: Repositioning of personnel, supplies, equipment. Includes airdrops and air landings.

Air Sustainment: Movement of personnel, equipment and supplies in support of a current and/or future operation.

Combat Mission: The conduct of forces engaged in the battlespace. Helicopters are active in the combat zone during actual combat.

Combat Mission Support: Provision of support to a combat mission. Tasks are usually removed from the active combat zone.

Taken from the doctrine used in the 2003 Review of the Defence Policy Requirements for the NZDF Helicopter Capability

Capability Requirements	Operational Requirements - Description and Explanation
Air Movement, Aerial Sustainment	Movement of an Army section – a minimum of eight fully equipped land force soldiers – to enable the smallest combat entity to conduct its tasks for success, safety and survivability.
Air Movement, Aerial Sustainment	Movement of an Army platoon – minimum of 27 soldiers and equipment – in a single wave to ensure synchronised arrival of combat elements.
Air Movement, Aerial Sustainment, Special Operations	Movement of a minimum of six fully equipped special forces soldiers in a single helicopter.
Aero-medical Evacuation	Movement of up to six stretcher casualties, plus medical staff, in a single helicopter.
Air Movement, Aerial Sustainment	Capacity to move specialist equipment, such as the Direct Fire Support Weapon.
Air Movement, Aerial Sustainment	Lift a light gun or light operational vehicle.
Air Assault, Combat Mission, Special Operations	Meet sovereignty requirements in EEZ, including maritime counter terrorism, and reach significant outlying islands in the South Pacific.
Aerial Sustainment	Quickly deployable by either C-130 Hercules aircraft or self-deploying to Australia or South Pacific.
Air Movement, Aerial Sustainment	Operate from the multi-role vessel to support the delivery of personnel and equipment to and from land.
Air Assault, Air Movement, Aerial Sustainment, Combat Mission, Special Operations	Operate day and night, in inclement weather and in a range of climatic, geographical and threat environments.

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

Schedule of Capability Definition Phase

Dates	Duration	Explanation
September 2001 to December 2003	27 months	See Narrative in section 1.1

Expenditure in Capability Definition Phase

	Expenditure (NZ$)	
Definition Phase	2003/04	213,676.50
	2004/05	53,805.60
	2005/06	185,621.62
	2006/07	82,526.18
	2007/08	NIL - project in acquisition phase
Explanation	In the capability definition phase, the above costs are classified as pre-acquisition costs and have been met from the NZDF's operating budget. During the FY03/04 to FY05/06 period, the costs were for training, light and medium utility capability definitions studies. The FY06/07 figure is for the medium utility helicopter project only.	

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

Date	2002	2003	2004	2005
Costs (NZ$ million)	400-500	400-550	400-550	480
Explanation of Variance	During the Capability Definition phase (2001-2003), the costs were estimates provided by the United Kingdom Ministry of Defence Price Forecasting Group. In 2005 it was believed that the preliminary cost information provided from industry indicated that options would be close to the 2005 amount shown above. However, at that time, it was also noted that the solution may exceed that amount.			

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial Estimate	2010 Updated Estimate	Actual
Date	First aircraft 2009	First aircraft early 2010	The first two (of eight) aircraft were delivered to New Zealand in December 2011
Explanation of Variance	Changes in the estimates during the Capability Definition phase are a normal part of a project's progress.		

PILOT TRAINING CAPABILITY

Project Description: The Pilot Training Capability Project (PTC) will replace the current military pilot training system with a capability that includes

- modern trainee selection tools which select those most likely to succeed as military pilots;
- flight simulation computers and flight simulators;
- the introduction of a fleet of modern training aircraft; and
- a new teaching curriculum that is matched to the pilot training requirements.

Policy Value

The New Zealand Defence Force (NZDF) requires about 15 new military pilots and up to 12 new Qualified Flying Instructors (QFI) each year to replace those who are promoted or leave.

These pilots need to be trained to an appropriate military standard and be capable of undertaking safe military air operations across the spectrum of NZDF operations and thereby to sustain and enhance the NZDF's contribution toward government options for:

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

Better Business Case Milestones

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. May also authorise Defence to engage with industry for more detailed information (e.g. Request for Information).

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

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

Date	Approved By	Approval
8 September 2010	Cabinet External Relations and Defence Committee ERD Min (10) 9/3	**Project Initiation.** Cabinet agreed that the Advanced Pilot Training Capability (APTC) project, that had been suspended pending the outcome of the Defence Review in 2009, be cancelled and a "fresh PTC project be established".
6 April 2011	Chief Executives	**PTC Project Charter.** This is the Charter for the revised PTC project.
10 August 2011	Cabinet External Relations and Defence Committee ERD Min (11) 6/7	**Approval of Indicative Business Case.** Cabinet considered the IBC and directed that two options (i) replace through lease or purchase and (ii) outsourcing be developed in the form of a DBC.
12 November 2012	Cabinet CAB Min (12) 40/13	**Approval of Detailed Business Case.** Cabinet agreed to proceed to tender for the support and support of new aircraft, training simulator and other systems for the full Wings Course – the Primary and Advanced Phases and the Qualified Flying Instructor resource.
3 December 2013	Cabinet Committee on State Sector Reform and Expenditure SEC Min (13) 18/5	**Approval of Project Implementation Business Case.** Cabinet authorised the Secretary of Defence to conclude a contract with Beechcraft Defense for the supply of aircraft, simulators and other training aids and initial training.

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.

Summary of Capability Definition Phase

Capability Requirement: A description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

The future requirement for military pilot training as a capital project was contained in the 2006 Defence Long-Term Development Plan. At that stage the project was named the Advanced Pilot Training Capability (APTC). Cabinet approved the commencement of the

APTC Project on 9 November 2007. The project at this stage was focussed on replacement of the existing fleet of B200 aircraft that were used for the advanced phase of pilot training.

Following Cabinet approval, the Ministry of Defence released a Request for Tenders in October 2008. Evaluation of the nine tenders received was suspended in October 2009 pending completion of the Defence Review and a new Capital Plan.

Subsequently, Cabinet agreed that the APTC project be formally closed and a fresh Pilot Training Capability (PTC) project be established.

An Indicative Business Case for the PTC project was considered by Cabinet on 10 August 2011.

The outcomes expected of the NZDF pilot training capability are:

(a) to operate the RNZAF Pilot Training Course that will produce qualified pilots with the required military competencies, in sufficient numbers, capable of conducting safe military air operations.

(b) to train flying instructors and flying supervisors, and

(c) to maintain the RNZAF Display Team.

The DBC refined the capability and operational requirements, and considered in detail the need for a trainee selection tool and the balance of ground-based (simulation) and experiential (airborne) training.

The technical requirements of the training aircraft were also considered, especially those that constrained aircraft choice. Some of these requirements will differentiate between aircraft, and potentially exclude some aircraft from consideration. These requirements are explained below so that their importance to the NZDF's pilot training capability is clear.

Aircraft type: in production: To mitigate the cost and time risks attached to a capability that is not type certified or in production.

Aircraft type: military register: Some of the activities required of fully qualified military pilots cannot be taught or undertaken under civil rules. For this reason the PTC aircraft must be held on the military register.

Aircraft type: speed requirement: A speed sufficient for the ability of trainees to absorb and process information inputs to be developed and tested.

Aircraft type: pressurised cockpit: Pressurisation reduces adverse physiological effects which can occur when flying unpressurised above 10,000 feet. Although not mandatory, the aircraft should be pressurised to provide for both a duty of care and flexibility perspectives.

Aircraft type: ejection seats: The NZDF has a duty of care to provide an adequate level of safety for its personnel. An ejection seat provides a markedly improved capability beyond that available by a parachute. An ejection seat is an essential requirement.

Aerobatic capabilities: The aircraft will need to be certified for aerobatic flying so as to test a pilot's spatial awareness and develop in pilots the confidence that they can safely and competently operate an aircraft in any environment throughout its entire operating envelope.

How Defence analysed the requirements options in the Capability Definition phase

The project team developed a cost-benefit model in order to compare the user requirements, benefits and the indicative costs for each option. The options were ranked on cost, delivery of training outcomes, safety and risk.

How Defence considered interoperability[7]

The Pilot Training Capability is for training only. It does not have a military operational or deployable aspect, so is not required to operate with other parts of the NZDF or other defence forces.

How Defence considered through-life costs and issues

Future operating costs were estimated, where appropriate, from existing pilot training costs In addition, tenderers were expected to provide proposals for the ongoing support of the aircraft and simulators. These costs were then compared to the cost of the Air Force undertaking maintenance through an in-house, military workforce. After consideration of the tender responses the Chief of Air Force agreed to adopt the outsourced support of the aircraft and simulators as a de-risking measure.

The Beechcraft contract includes a clause to examine and renegotiate the logistics and maintenance costs after five years. Foreign exchange rates, the cost of aviation fuel and the costs of flying instructors and other staff are the major variables in the operating costs. Many of the variable costs (fuel, maintenance, etc) are determined by the rate of flying (hours per year) and this is determined by the number of trainees accepted onto each course and their subsequent progress and pass/fail rates.

[7] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

Requirements Analysis in the Capability Definition Phase

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.

Options considered	Cost Estimates (NZ$ million)	Advantages	Disadvantages
Option 1: "Do Nothing"	Capital: $0 Operating/year: $14	None.	Does not address any of the benefits or critical success factors
Option 2: Current system **plus** address recruitment, selection and ground-based training components including SIMs	Capital: $0 Operating/year: $14	Immediate delivery. Meets selection benefit and classroom training only.	Does not meet safety requirements or training outcomes. Does not address issue of unsuitability of training aircraft or impending end of life.
Option 3: Option 2 **plus** Upgrade existing B200 to new digital cockpits	Capital: $2 Operating/year: $14	In addition to Option 2 meets benefit of glass cockpit.	Marginal safety improvements. Does not address issue of unsuitability of training aircraft or impending end of life.
Option 4 Option 3 **plus** new advanced training aircraft for advanced phase	4a:Purchase: Capital: $88 Operating/year: $14 4b: Lease: Capital: $0 Operating/year: $23	Meets all benefits, success factors and safety requirements.	Does not address issue of impending end of life for aircraft used in the primary phase of training.
Option 5: Overseas military	Capital: $160 Operating/year: $66	Likely to meet all benefits, success factors and safety requirements.	Not affordable.
Option 6: Commercial partnership	Capital: $0 Operating/year: $41	Likely to meet all benefits, success factors and safety requirements.	Possibly affordable.
ASSESSMENT: On the basis of delivery of benefits, meeting all safety requirements and affordability (capital and operating), Option 4 was selected.			

Description of the Capability and Operational Requirements

Capability Requirements- The capability requirements necessary to support policy objectives include:	**Operational Requirements-** The Operational Requirements Necessary to support the capability include
• Able to train 15-20 new pilots per year. • Provide and maintain Military Qualified Flying Instructors. • Develop Flying Supervision to the highest standards. • Produce Military Pilots. • Allow NZDF to approve the training curriculum and to specify the levels of competence and experience of graduates.	The Pilot Training Capability will deliver: • at least one RNZAF pilot training course ('Wings' Course) per year for up to 20 students per course; • at least one Flight Instructor Course per year; and • an RNZAF flying display team.
NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations	

Schedule of Capability Definition Phase

Dates	Duration	Note
September 2010 to November 2012	26 months	The capability definition phase included the development of the IBC and DBC. The scope of the project was adjusted to include the full training requirements following receipt of responses to the RFI.

Expenditure in Capability Definition/ Source Selection Phase

	Expenditure (NZ$)	
Definition Phase	2010/11	$92,103
	2011/12	-
	2012/13	$225,407
	2013/14	$259,244
Explanation	During the definition phase, the above costs were classified as pre-acquisition costs and were met from the NZDF's operating budget.	

History of Cost Estimates in the Capability Definition Phase

Date	2006	2008	2011	2012
Costs ($M)	Unstated	$65-75	$88	$141-167
Explanation of Variance	The capital cost was not stated in the 2006 Long-Term Development Plan (LTDP). The initial cost estimates in the 2008 LTDP and the IBC in 2011 were for the Advanced Phase of the Wings course only. The DBC in 2012 expanded the scope of the project to cover the full Wings Course.			

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	Estimate at Contract Signing	30 June 2016 Actual
Date	2010 in 2008 LTDP.	Capability will be in service for the first Wings Course in early 2016.	February 2016
Explanation of Variance	The initial estimate was for the replacement of the B200 aircraft only under a project known as the Advanced Pilot Training Capability that was cancelled in 2009.		

ANZAC FRIGATE PLATFORM SYSTEM UPGRADE

Project Description: The Platform Systems Upgrade (PSU) is addressing equipment obsolescence, performance degradation, operational limitations and compliance issues with the platform systems of the ANZAC class frigates. These platform systems are distinct from combat capabilities and enable the frigates to move, float, generate power and recover from damage.

Policy Value

The PSU will maintain the operational effectiveness and efficiency of the ANZAC frigates, HMNZ Ships *Te Kaha* and *Te Mana,* over their remaining lives. It will thereby sustain and enhance the Naval Combat Force's contribution toward government options for:

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

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 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.

Date	Approved By	Approval
11 September 2006	Cabinet CAB Min (06) 34/2	**Approval to Initiate.** Cabinet agreed to include the ANZAC PSU as a new project in the revised 2006 Defence Long Term Development Plan (LTDP) and authorised Defence to commence definition and options analysis.
19 November 2007	Cabinet CAB Min (07) 42/3	**Approval to Commence.** The Ministry of Defence was authorised to release the tender documentation for the PSU. Defence was also authorised to seek approval from Joint Ministers (Minister of Finance and Minister of Defence) to enter into a contract not to exceed NZ$57.6 million once the tender evaluation process had been completed.
19 May 2008	Joint Ministers	**Approval of Revised Acquisition Strategy**. Joint Ministers approved a revised acquisition strategy to break the project down into four elements (see section 1.1) and authorised the Ministry of Defence to procure long lead items and commit initial funding for project start up costs.
23 October 2008	Joint Ministers	**Approval to Commit.** Joint Ministers approved funds for the power upgrade and stability enhancement and compartment changes elements of the project.
22 December 2010	Joint Ministers	**Approval to Commit.** Joint Ministers approved funds for the Integrated Platform Management System (IPMS) and Heating, Ventilation and Air Conditioning (HVAC) elements of the project.
December 2013	Cabinet Committee on State Sector Reform and Expenditure Control, having been authorised by Cabinet to have the Power to Act CAB Min (13) 43/44	**Approved** changes to appropriations by way of a fiscally neutral adjustment of $6.0 million from Defence projects to the PSU project for completion of phase 2 work on HMNZS *Te Kaha***.** **Directed** Defence to report back in the first quarter of 2014 with a plan for commissioning phase 2 upgrade work on HMNZS *Te Mana.*
8 April 2014	Cabinet Committee on State Sector Reform and Expenditure Control having been authorised by Cabinet to have the Power to Act SEC Min (14) 4/2 CAB Min (14) 13/4	**Noted** that approximately $22.2 million (including contingency) will be required to complete phase 2 work on HMNZS *Te Mana*. **Approved** changes to appropriations as fiscally neutral adjustments of $12.4 million from identified projects and $9.8 million from reprioritisation of NZDF capital funds.

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

The PSU Project was initiated following a reprioritisation of Defence's Long-Term Development Plan in September 2005, in which the PSU Project was identified as a priority. In May 2006, the NZDF's Assistant Chief of Development assembled a joint MoD and NZDF team to conduct planning for the Project. The issue that the Project sought to address was the obsolescence and wearing out of the Platform Systems on the ANZAC class frigates. The Platform Systems that the project would upgrade included the propulsion systems, electrical power generation and distribution, auxiliaries, damage control and platform management. In August 2006 a project charter and management plan were developed, and in November 2006 Cabinet agreed to include the project in the Defence Long-Term Development Plan.

Following this approval, the project team carried out an analysis to identify the technical requirements for the PSU. Operational deficiencies, maintenance requirements, and manning constraints drove the initial requirements. These requirements were subsequently analysed against policy objectives, the identified risks, and the potential risk mitigation measures. The findings of this process were presented to Defence's Integrated Capability Management Committee in the form of an internal initial gate document in May 2007.

Following the initial work, an analysis of options for the upgrade was undertaken, the findings of which were worked into a Comprehensive Capability Investment Proposal in October 2007. The Comprehensive Capability Investment Proposal formed the basis for a Cabinet paper that then sought government approval to proceed. Cabinet approved this paper, and the proposed upgrades for the ANZAC class Frigates in November 2007.

The upgrade was planned to coincide with a major scheduled overhaul of the frigates' diesel engines, which was a parallel project to be funded using NZDF operating capital and to occur in conjunction with the PSU. The engine upgrade integrated new engines because this was less expensive than refurbishing the old engines.

How Defence analysed the options

The Project Team carried out analysis of various options for the project throughout 2007. The principal parameter on which these options were based was cost. These cost-based options were then assessed according to criteria that covered key areas of risk and capability associated with the upgrade project. The criteria included:

- operating profile;
- environmental envelope;
- training impact;
- manpower reduction;

- environmental compliance;
- future capability;
- supportability;
- reliability; and
- affordability.

The Project Team presented the findings of the options analysis to the Defence Executive Capability Board in July 2007. The Executive Capability Board accepted the proposed options and recommended they be further developed in the Comprehensive Capability Investment Proposal that was produced in 2007. Three options were examined in detail in the Comprehensive Capability Investment Proposal, and then presented in the November 2007 Cabinet paper seeking approval to proceed. These options are detailed in the table in section 1.2.

How Defence considered interoperability[8]

Interoperability has been a key consideration for the PSU project because 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 signing, in 1991, of an Implementing Arrangement for the Management of Assets and the In Service Support of the ANZAC class Frigates and shore facilities.

These arrangements, coordinated through the then Australian Defence Material Organisation of the Australian Defence Force and the RNZN, provide insurance for the fleet, as well as a pool of rotables and spares for maintaining the ships.

How Defence considered 'through-life' costs and issues

The RNZN ascertained estimated 'through life' costs from a range of sources (but not from industry as consultation with industry prior to 'main gate' was not permitted). From this broad base of information a range of costs was assembled that covered the best and worse case scenarios for the upgrade. Within these costs, the most significant through-life components per ship were depreciation, fuel and personnel costs.

From this information, the net present values were calculated for the worst case scenario. This information was compared through the use of a cost benefit analysis against each of the options to be included in the Comprehensive Capability Investment Proposal. It was estimated that option three would realise an operational expenditure savings of NZ$27.0 million.

[8] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare assess and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

Options for Upgrading the Platform Systems on the ANZAC Frigates		
Options Considered	**Capability option**	**Description**
Option 1	Undertake the minimum amount of work required to maintain the current availability of the ANZAC frigates.	This option would include: • maintenance of the ships' 3600t displacement; • maximum power output from the Propulsion Diesel Engines limited to 3.2MW; • maintaining of the original Heating, Ventilation, Air Conditioning system, but replacement of the type of gas (R22) used in this system; and • control and monitoring system replaced by an Integrated Platform Management System with simulator function.
Option 2	Undertake the level of work required to maintain availability of the ANZAC frigates and improve their ability to deploy, in support of government policy, in all operating environments.	This option would include: • an increase of the ships' displacement to 3700t; • maximum power output from the Propulsion Diesel Engines increased to 3.6MW; • upgrade of the Heating, Ventilation, Air Conditioning system, and replacement of the type of gas (R22) used in this system; and • control and monitoring system replaced by an Integrated Platform Management System with simulator function.
Option 3 – **the recommended option**	Undertake work to provide the ANZAC frigates with the equivalent capability as Option 2, but incorporating improved overall operational efficiency and cost-effectiveness.	This option would include: • an increase of the ships' displacement to 3700t; • maximum power output from the Propulsion Diesel Engines increased to 4.4MW (with new TB93 engines); • upgrade of the Heating, Ventilation, Air Conditioning system, and replacement of the type of gas (R22) used in this system; and • enhanced Integrated Platform Management System with integrated bridge system, onboard operational trainer, remote monitoring capability, and battle damage control system.

ASSESSMENT	The third option was considered affordable at the time. It addressed equipment obsolescence, environmental compliance issues, overcame all identified operational constraints and provided a future growth margin. It also provided the ANZAC frigates with the ability to fill their operational profile efficiently and within the manpower constraints.

Description of the Capability and Operational Requirements

Capability Requirement	Operational Requirements – Description and Explanation
Stability of frigates after incurring damage and their reserve buoyancy	• A minimum weight growth margin of 100 tonne. • Conformance to the requirements of DEF AUST 500, Australian Defence Force Maritime Materiel Rule Set, Vol. 3, Hull System Requirements, Part 2 Stability of Surface Ships and Boats.
ANZAC Operational Profile – the propulsion configuration system	• Propulsion systems where the diesel engines shall, in combination, provide sufficient power to drive the ship not less than 20 knots under the specified design environmental conditions at a maximum displacement of 3700 tonnes.
High Temperature Operating	• Adopt the ISO 7547-2002 standard for heating, ventilation and air conditioning. • An environmental control system which is capable of controlling the ship's internal air temperatures. • A chilled water cooling capacity of not less than 986 kW.
Control and Monitoring System that delivers automated functions across all platform systems	• Integrated platform management systems. • Simplified propulsion control. • Gas turbine engine control module. • Integrated bridge system. • Onboard operational trainer. • Enhanced battle damage control system. • Remote monitoring capability.

Schedule of Capability Definition Phase

Dates	Duration	Explanation
September 2005 – October 2007	25 months	During this period Defence analysed the requirements, identified options and received approval to upgrade the platform systems on the ANZAC frigates.

Expenditure in Capability Definition/ Source Selection Phase

	Expenditure (NZ$)	
Definition Phase	2003/04	24,155.41*
	2004/05	49,145.86*
	2005/06	171 336.52*
	2006/07	136,855.58*
	2007/08	650,652.71[+]
	2008/09	(7,725.83)[+]
Explanation	In the definition phase, the above costs are classified as pre-acquisition costs and have been met from the NZDF's operating budget. *During the period FY03/04 to FY06/07, these figures included costs from the ANZAC PSU and the ANZAC Self Defence Upgrade. [+] During the period FY07/08 to FY08/09 these figures were for PSU costs only.	

History of Cost Estimates in the Capability Definition Phase

Date	2006 (NZ$ million)	2007 (NZ$ million)
Costs	50-60	49.5 - 55.7
Explanation of Variance	N/A	

Estimates of Proposed Schedule in the Capability Definition Phase

ORIGINAL ESTIMATE		30 JUNE 2016 ESTIMATE		ACTUAL	
HMNZS *Te Kaha*		**HMNZS *Te Kaha***		**HMNZS *Te Kaha***	
Start of Upgrade (part one)	January 2009	Part One Implementation	N/A	Part One Implementation	February 2010
Start of Upgrade (part two)	August 2009	Part Two Implementation	N/A	Part Two Implementation	January 2013
Upgrade complete	Not provided	Upgrade complete	N/A	Upgrade complete	September 2014
HMNZS *Te Mana*		**HMNZS *Te Mana***		**HMNZS *Te Mana***	
Start of Upgrade (part one)	Mid 2009	Part One Implementation	N/A	Part One Implementation	December 2010
Start of Upgrade (part two)	Mid 2010	Part Two Implementation	N/A	Part Two Implementation	May 2014
Upgrade complete	Not provided	Upgrade complete	June 2016	Upgrade complete	April 2016
Project closure	Not provided	Project Closure	March 2017	Project Closure	December 2017
Explanation	In May 2008 Defence sought Joint Ministers (Defence and Finance) authorisation to adopt a revised acquisition strategy to allow the propulsion systems component of the PSU to be undertaken in conjunction with the engine replacements planned for during the frigates' extended maintenance periods in 2009 and 2010. However, the tight timeframe prevented the other elements of the PSU project from being ready at that time and were, therefore, rescheduled for implementation during subsequent maintenance periods. The 2nd phase of the upgrade (Part Two) was delayed 12 months by the December 2011 meeting of the Defence Capability Management Board. This meeting decided that *Te Kaha* would be the lead ship for the installation of PSU Phase 2 in 2013 and that *Te Mana* would follow in 2014. The delay was to enable the technical solution to be further developed and proven before implementation.					

ANZAC FRIGATE SYSTEMS UPGRADE

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

Policy Value

The FSU will maintain the combat effectiveness and efficiency of the ANZAC frigates, HMNZ Ships *Te Kaha* and *Te Mana,* over their remaining lives. It will thereby sustain and enhance the Naval Combat Force's contribution toward government options for:

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

The Defence White Paper 2010 (DWP) reiterated the Government's requirement that the frigates will provide effective, credible combat capabilities, and for the frigates to be given a self-defence upgrade by 2017[9] to address obsolescence and to improve their defensive capability against contemporary air and surface threats.

[9] Since the 2010 White Paper the completion date has been updated (see Volume 2, Section 2.2 Schedule of Introduction into Service)

Better Business Case Milestones

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. May also authorise Defence to engage with industry for more detailed information (e.g. Request for Information).

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

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

Date	Approved By	Approval
June 2007	Secretary of Defence & Chief of Defence Force	**Original Project Charter**
29 March 2012	Secretary of Defence & Chief of Defence Force	**Revised Project Charter.**
6 August 2008	Cabinet POL Min (08)14/6	**Approval of Indicative Business Case.** Cabinet agreed that all five options be fully developed for a main gate business case that will be prepared by officials.
12 November 2012	Cabinet CAB Min (12) 40/5A	**Approval of Detailed Business Case.** Cabinet approved Option 4[10] and authorised the Secretary of Defence to issue Requests for Tender.
14 April 2014	Cabinet CAB Min (14) 13/14	**Approval of Project Implementation Business Case.** Cabinet agreed to proceed with the FSU and authorised the Secretary of Defence to conclude contacts.

[10] Option 4 is described below.

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.

Summary of Capability Definition Phase

Capability Requirement: A description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

The FSU Project, originally known as the Self Defence Upgrade, was initiated in 2007. The Royal New Zealand Navy had advised that the ANZAC frigates were over 10 years old and that many of the surveillance and combat systems were becoming obsolete and in need of replacement. Threats in the maritime environment had also changed, with new technology once only available to larger countries now becoming available to small states and other groups. The purpose of this project is to ensure that the mission and weapon systems onboard the ANZAC class frigates continue to contribute towards their combat viability. It will address the erosion of capability through a combination of system obsolescence and emerging threats.

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

A number of mission systems were identified as facing imminent obsolescence and their support was becoming increasingly difficult and expensive. An Indicative Business Case 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. 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 (RAN) 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
- Infra Red Search and Track
- Radar Electronic Support Measures
- Communication 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[11]

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

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

The Royal Australian Navy has embarked on an upgrade project for their ANZACs. There are many systems common to both navies and these were incorporated in the options considered. Each of the options was designed to retain interoperability with Australia and other partners whilst providing a useful level of complementary capabilities.

How Defence considered through-life costs and issues

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

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

[11] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

Requirements Analysis in the Capability Definition Phase

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.

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 million	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 million	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 million	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 million	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 million	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 – The capability requirements necessary to support policy objectives include:	**Operational Requirements –** The 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.	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). The use of both the visible and infra red spectra provides a significant passive means of detection, tracking and identification. Infra Red Search and Track

5. Effects Ashore The Command shall be able to deliver effects ashore from organic weapons to the Combined Force Commander in order to support land operations. **6. Through Life** The Logistics Commander (Maritime) shall be able to deliver availability characteristics to the Commander Joint Forces NZ in order to enable completion of a mission throughout the life of the platform.	(IRST) systems provide near continuous 360° observation. The infrared component of these sensors allows a high level of capability to be maintained at night and in poor atmospheric conditions. Air Defence. Air defence against attacking aircraft or missiles is local area and point defence. They span a range from approximately 2km to 30km from the ship and can include the ability to defend protected units (usually other vessels) within a limited range. This defence is considered credible for a general purpose frigate and is achieved using Point Defence Missile Systems. Closer in defence is conducted at ranges less than 2km and uses systems such as the Phalanx Close in Weapons System (CIWS) and missile decoys such as chaff. Anti Surface. Existing weapons provide strike capability for anti-surface warfare. The FSU project will need to bridge the capability gap in the sensors necessary to optimise the performance of these weapons. Under Sea Warfare. The FSU User Requirements are for the detection of and defence against a torpedo launched at the ship. The frigates' sensor-sharing capability will usually deter a submarine from undertaking surveillance near the ship. Support to Joint Task Force (JTF). The DWP has placed an emphasis on the NZDF being able to respond to security events in the Pacific region and further afield into Asia. The NZDF frigates have an important role to provide defence for a task group and to provide multi-source high quality surveillance and reconnaissance data.
NOTE: The operational and capability requirements listed here were those identified in the suite of requirement documents produced during the Capability Definition Phase. During the tender and contract negotiation process these requirements are converted into function and performance specifications (FPS) that become the contracted deliverables. During the contract negotiation process the operational requirements have to be balanced against cost or viability considerations.	

Schedule of Capability Definition Phase

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

Expenditure in Capability Definition/ Source Selection Phase

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

History of Cost Estimates in the Capability Definition Phase

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

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial	Estimate at Contract Signing	30 June 2016 Estimate/Actual
Date	Around 2010	Ship 1: March 2017 Ship 2: February 2018	Ship 1: September 2018 Ship 2: September 2019
Explanation	The June 2016 amendments reflect the changes to the refit start date but the actual acceptance dates remain under review and will only be confirmed once the installation Contract Change Proposal has been agreed in May 2017.		

MARITIME HELICOPTER CAPABILITY

Project Description: This project is providing an upgraded fleet of naval helicopters for the Royal New Zealand Navy. Eight SH2G (I) Super Seasprite helicopters are being acquired from Kaman Aerospace with associated spares, training aids and a full-mission flight training simulator. Two additional helicopters are part of the package. These will be stored for use as attrition airframes and for spare parts. The Project will also include acquisition of Penguin missiles to replace the current stock of Mavericks.

The existing SH2G (NZ) Super Seasprite fleet was scheduled for a major upgrade of avionics and mission systems by 2015 to address system obsolescence. The offer of a fleet of SH2G (I) Super Seasprites with these systems already upgraded was assessed to provide greater value for money and at lower project risk.

Policy Value

The Naval helicopters are a component of the Naval Combat Force and provide rotary wing surveillance, warfare and airlift that enhance the Government's options for utilising the NZDF for the principal tasks set out in the Defence White Paper 2010, in particular:

- to defend New Zealand's sovereignty;
- to discharge our obligations as an ally of Australia;
- to contribute to and, where necessary, lead peace and security operations in the South Pacific;
- to contribute to whole-of-government efforts at home and abroad in resource protection, disaster relief, and humanitarian assistance; and
- to make a credible contribution in support of peace and security in the Asia-Pacific region.

Better Business Case Milestones

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 shortlist of capability options to the Detailed Business Case stage. May also authorise Defence to engage with industry for more detailed information (e.g. a Request for Information).

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 arrangements to manage the project and the ongoing delivery of services.

Date	Approved By	Approval
07 April 2010	Minister of Defence	**Project initiation.** The Minister of Defence recommended a "no obligations" due diligence study on the unsolicited Kaman Aerospace offer.
26 September 2011	Cabinet CAB Min (11) 35/1	**Approval of Indicative Business Case.** Cabinet directed Defence officials to report on the conclusions of the due diligence process with a detailed business case comparing the Kaman offer with an appropriate upgrade to the existing Seasprite fleet.
26 March 2012	Cabinet CAB Min (12) 10/2	**Approval of Detailed Business Case.** Cabinet authorised Defence officials to enter into contract negotiations with Kaman Aerospace.
15 April 2013	Cabinet CAB Min (13) 12/12	**Approval of Project Implementation Business Case.** Cabinet authorised Defence officials to sign contracts with Kaman Aerospace and other suppliers.

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

The 2002 Maritime Forces Review affirmed the value of a maritime helicopter capability embarked on the frigates (*Te Mana* and *Te Kaha*), the multi-role vessel (*Canterbury*) and the offshore patrol vessels (*Wellington* and *Otago*). The report noted that this role would be met by the Seasprite maritime helicopters.

Following on from the Maritime Forces Review, the Future Maritime Helicopter Review of 2010 noted six requirements:

(a) conduct military and civil surveillance;

(b) embark and operate from all RNZN aviation-capable units;

(c) detect threats in a hostile environment;

(d) conduct maritime search and rescue;

(e) prosecute surface and sub-surface targets; and

(f) utility lift.

These were reaffirmed in the Defence White Paper 2010: *"Naval helicopters will continue to provide extended reach, surveillance, and air delivered weapon capabilities (air-to-surface missile and anti-submarine torpedo) for the frigates."*

The current fleet of five Seasprite helicopters were contracted for in 1994 and entered service in 2001. An upgrade to the avionics and mission systems was anticipated at that time to be required before 2015. By 2005 the Air Force and Navy were recording significant deficiencies and growing obsolescence in the Seasprite mission systems. Maintenance costs and down-time were increasing, and Output Plan requirements were not being met. These issues were examined in a Ministry of Defence Evaluation Report (Report 9/2011) concluding that maintenance practices, long lead times on critical parts and the small fleet size (5 aircraft) were contributing factors.

Their involvement with the Evaluation Report and subsequent enquiries about upgrade options and costs alerted Kaman Aerospace to these issues. Following the cancellation of Kaman's contract to supply 11 Seasprites to the Australian Navy, in July 2009 Kaman made an unsolicited offer of this fleet to New Zealand, as a cost-effective alternative to upgrading the current New Zealand fleet.

In April 2010 the Minister of Defence, having been advised of the issues attached to the ex-Australian fleet, recommended that Defence undertake a "no obligations" due diligence of the offer. A project team was established, producing the Future Maritime Helicopter Review paper in December 2010. This analysis compared the Kaman offer to a range of options from "do nothing" through to the purchase of a fleet of new maritime helicopters. As part of this study the Defence Technology Agency examined the helicopter fleet size required to deliver the expected outputs (DTA Report 327).

In February 2011 the Minister of Defence was advised of the key findings of that Future Maritime Helicopter Review. The Minister directed that the Kaman offer should be subject to independent review. In August 2011 the Minister approved the engagement of an independent consultant and for Defence to engage with Kaman, prior to reporting to Cabinet. Marinvent Corporation of Canada undertook an initial airworthiness review of the ex-Australian fleet.

An Initial Business Case was developed and consulted with other agencies. In September 2011 Cabinet agreed that the Kaman offer should be pursued and authorised Defence officials to undertake further engagement with Kaman to report back with a Detailed Business Case (DBC). The DBC recommended that the Kaman offer be accepted and in March 2012 Cabinet agreed to contract negotiations with Kaman. The outcome was reported to Cabinet in April 2013 and following approval a contract with Kaman was signed in May 2013.

How Defence analysed the options

The Future Maritime Helicopter Review examined the capability and operational requirements for naval aviation. Eight options were developed and assessed against these requirements and estimated costs. The report recommended the purchase of the ex-Australian fleet.

How Defence considered interoperability[12]

Interoperability of the maritime helicopter is an important consideration. The helicopter is expected to be able to operate from the deck of New Zealand and Australian ANZAC frigates and other aviation-capable naval vessels. They should also be able to operate with most coalition partners.

[12] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

How Defence considered 'through-life' costs and issues

Through life costs were derived from the historic costs of operating the existing fleet of five Seasprites, adjusted for changes in fleet size and maintenance regimes with added costs for indigenous software and flight simulator support.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare assess and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

Options Considered	Cost Estimate[13] (NZ$ million)	Advantages	Disadvantages
Status quo	Nil	• Nil advantages.	• Platform becoming unsustainable. • Insufficient aircraft for requirements. • Lack of training simulator increases training risks. • Continued poor availability. • Increasing capability degradation of mission and critical systems. • Increased operating costs.
Mid-Life Upgrade	175	• One-off project minimises disruption. • Some decrease in operating costs. • No changes required in establishment, infrastructure or IT.	• Insufficient aircraft for requirements. • Critical systems may become unavailable before upgrade completed. • Lack of training simulator increases training risks. • Unlikely to address spare parts shortfall.
Mid-Life Upgrade and purchase of additional aircraft	330	• One-off project minimises disruption. • Some decrease in operating costs per flying hour. • Addresses availability shortfall. • No changes required in establishment, infrastructure or IT.	• Increase in overall operating costs due to larger fleet. • Critical systems may become unavailable before upgrade completed. • Lack of training simulator increases training risks. • Unlikely to address spare parts shortfall.

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

Acquire fleet of ex-Australian Seasprites	175	• Meets most operational requirements. • Addresses availability shortfall. • Provides updated mission and navigation systems. • Addresses impending obsolescence issues. • Includes flight training simulator. • Aircraft package available, minimising delivery time. • Minimal changes required in establishment, infrastructure or IT.	• The aircraft have not been through full airworthiness certification or introduction into service processes. • Unknown risks associated with modification of the software. • Increase in establishment and operating costs.
Purchase of 8x AW159 Wildcat	665	• New aircraft design. • Meets or exceeds all user and operational requirements. • A fully integrated avionics system. • Expected to be cheaper to maintain than the Seasprite.	• May not be cheaper to operate than Seasprite. • Aircraft is still under development. • Would require full certification and introduction processes. • Expensive but costs not well known at this stage.
Purchase of 8x AW109	245	• Light utility helicopter. • Widely used in light utility and training role. • Compatible with all existing Navy aviation-capable vessels. • Reduced capital and operating costs. • Commonality with the recently introduced training helicopter.	• Significantly reduced capability over the Seasprite. • Meets few of the user and operational requirement. • Unable to carry the required surveillance equipment. • Not used in this role by other navies. • Would require full certification and introduction processes in this role. • Not designed to operate in the maritime environment for long periods.

Purchase 4x NATO Frigate Helicopters (NFH)	770	• Would meet all user and operational requirements for operations off the frigates and larger vessels. • A modern aircraft design using composite materials. • Designed for operations from frigates and similar vessels. • Would be a significant enhancement over the Seasprite. • A fully integrated avionics system. • High commonality with the NH90 in training and maintenance.	• Capabilities in excess of requirements. • Capital cost not well known but based on the NH90 will be expensive compared to other options. • Unable to operate from OPVs. • Operating costs not well known but will be higher than Seasprite. • Still under development and with significant schedule delays. • Significant infrastructure upgrade requirements.
Purchase 4x NFH and 4x AW109	890	• Eight helicopters will cover all NZDF vessels. • Would meet all user and operational requirements. • High commonality with the NH90 and AW109 in training and maintenance.	• Expensive. • Two additional aircraft types (which will entail a greater infrastructure and support burden). • Operating costs not well known but will be higher than Seasprite. • Still under development and with significant schedule delays. • Significant infrastructure upgrade requirements.
ASSESSMENT		Option 0 was discounted because it failed to meet operational requirements. Option 1 was considered possible but has high risks associated with a bespoke upgrade path. Option 2 was considered possible but has high risks associated with a bespoke upgrade path and the requirement to locate and upgrade four additional aircraft frames. Option 3 was recommended as the preferred option. It would meet nearly all requirements, has low risk and is considered to be affordable. Option 4 was worthy of further consideration but is unlikely to be affordable. Option 5 was not recommended. It could not meet most user requirements. Option 6 was not recommended. Although it met or exceeded most user requirements it was a large helicopter that could only operate from the frigates. It is in the early stages of entering service, with significant development and delivery delays. Option 7 was not recommended. Although it met or exceeded most user requirements it was expensive and would require significant infrastructure development.	

Description of the Capability and Operational Requirements

Surveillance and reconnaissance: Maintain situational awareness in the maritime domain, provide continuous surveillance of an area or provide advance warning of a threat.

Offensive action: Conduct offensive surface and subsurface warfare.

Utility Lift: Conduct replenishment and transport including under-slung loads.

Capability Requirements	Operational Requirements - Description and Explanation
Surveillance and reconnaissance, offensive action, utility Lift	Conduct military and civil surveillance in all weather conditions, day and night up to and including SS 5 and in a range of climatic, geographical and threat environments.
Surveillance and reconnaissance, offensive action, utility Lift	Embark and operate from all RNZN aviation capable units up to the top of SS 5 and from appropriately equipped coalition ships.
Surveillance and reconnaissance, offensive action	Prosecute anti-surface and anti-submarine targets, acting autonomously or in a co-ordinated force with a variety of weapon payloads and targeting systems.
Surveillance and reconnaissance, offensive action	Detect threats in a hostile environment and be able to automatically deploy the appropriate countermeasures.
Surveillance and reconnaissance, utility Lift	Conduct boarding operations. by landing, fast roping (with at least two ropes), and winching.
Surveillance and reconnaissance, utility Lift	Conduct maritime SAR and be able to hoist personnel and equipment including a rescued swimmer, medical staff and an injured person.
Utility Lift	Transport personnel to and from other naval units or small, unprepared landing sites.
Utility Lift	Transfer equipment and supplies between ships whilst underway or at anchor and between ship and shore.
Surveillance and reconnaissance, offensive action, utility Lift	Be interoperable with other NZDF units, relevant government agencies and likely coalition partners through communications and data exchange.
NOTE: The operational and capability requirements listed here were those identified in the Concept of Employment document produced during the Capability Definition Phase.	

Schedule of Capability Definition Phase

Dates	Duration	Explanation
April 2010 to April 2013	36 months	See Narrative in section 1.1

Expenditure in Capability Definition/ Source Selection Phase

	Expenditure (NZ$)	
Definition Phase	2010/11	102,294.05
	2011/12	350,849.61
	2012/13	288,018.42
Explanation	In the capability definition phase, the above costs are classified as pre-acquisition costs and have been met from the NZDF operating and capital expenditure budgets.	

History of Cost Estimates in the Capability Definition Phase

Date	2010	2011	2012	2013
Costs (NZ$ million)	175	175	182	242
Explanation of Variance	The initial project costs were baselined against the existing allocation in the Capital Plan for the mid-life upgrade of the existing Seasprites. Project costs increased during the Capability Definition Phase as the NZDF and MOD refined the the scope of the project and through-life costs were able to be better understood.			

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial Estimate	Updated Estimate	30 June 2013 Estimate	Actual as at 30 June 2016
Date	Not stated	Not stated	Delivery of first aircraft to New Zealand by January 2015. Last aircraft by August 2015.	The first tranche of three helicopters were delivered to New Zealand on 15th January 2015. The final two aircraft were accepted in September 2015.
Explanation of Variance	Acceptance dates depended on the date of entering into contract. These dates were not able to be confirmed until after the contract was negotiated and approval was obtained to enter into contract.			

INDIVIDUAL WEAPON REPLACEMENT

Project Description: The purpose of the Individual Weapon Replacement project is to replace the existing New Zealand Defence Force (NZDF) 5.56mm Steyr rifle and the 40mm grenade launcher with a new individual weapon and grenade launcher. To meet the needs of future operating environments, the Individual Weapons Replacement Project requires a move from a closed to open architecture design which gives the user the ability to change systems and ancillaries, as well as adjust the size.

Policy Value

The primary tool for all military personnel, whatever their specialisation, is their individual weapon.

The current Steyr individual weapon was introduced into service in the late 1980s, and needs to replaced with a modern weapon. The Project to replace the Steyr is founded on the ability to deploy rapidly in task groups tailored to requirements. This concept was set out in the Defence White Paper 2010 (DWP 2010). The Defence White Paper 2016 was released after the weapons Project had been approved. The Future Joint Operating Concept (which describes how the NZDF will meet this policy) and the Annual Plans and Statements of Intent describe the outputs required by Government.

The organisational benefits of addressing these issues are, in summary:

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

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

Better Business Case Milestones

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. May also authorise Defence to engage with industry for more detailed information (e.g. Request for Information).

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

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

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

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

The current Steyr rifle was originally purchased for the NZDF over the period 1987-1991. The total NZDF procurement was 18,000 rifles, and the original planned 'life of type' was through to 2011.

The rifle has exceeded its planned life, in part because the quantity originally procured is greater than currently required. This has allowed the progressive retirement of 8,000 rifles. However, as the fleet shrinks, the wear on the remaining stock increases.

Continuous operational experience has further highlighted the key issues with the Steyr. The greatest deficiency is the ability to effectively detect, recognise, identify and engage targets at requisite ranges. Improving this requires advanced sighting systems, which cannot be fitted to the Steyr. Its closed design architecture does not allow this.

In addition, as the rifles age, reliability decreases. This can affect soldier confidence in their weapon. This issue is not unique to Steyr – all rifles that are well used will wear over time.

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

Because of this (and to benefit from technology advances), the NZDF has replaced its rifles approximately every 20 years.

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

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

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

These issues have been recognised and led to a partial upgrade of 385 rifles over 10 years ago. Because they have better combat attributes, these particular rifles have been used more intensively than others, both for operations and training (as it is desirable to train using the configuration of rifle that will be used on operations). As a result they are wearing faster, and are at greater risk of failure, than the un-modified rifles.

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

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

How Defence analysed the requirements options in the Capability Definition phase

The options examined were:

- Addressing the age and capability gap of the current individual weapon fleet through upgrading existing rifles.
- Finding an alternative to a rifle as an individual weapon.
- Delaying the project.
- Trade price for performance.
- Full versus partial fleet replacement.
- Weapon fleet size to meet 20 year operational effectiveness

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

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

- Addressing the age and capability gap of the current individual weapon fleet through upgrading existing rifles was eliminated as an option, as the earlier project to achieve this was unable to deliver a feasible solution.

- Delaying the project was eliminated as an option. The capability shortfalls had been identified. The Chief of Army has stated on more than one occasion that should a medium/large operational deployment for anything other than low intensity situation arise, an urgent operational requirement for a contemporary rifle would need to be undertaken.

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

The options analysis was therefore confined to an examination of a full versus partial fleet replacement, and the quantities required.

Overall Conclusion

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

2. It should be noted that the Single Stage Business Case had as out of scope an assault rifle fleet for special operations forces unless the individual weapon project matched the special forces user requirements.

3. In the event, the selected individual weapon did match the special operations forces user requirement, and the final acquisition and funding reflects this.

How Defence considered interoperability[15]

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

a. the cost of 3,000 new rifles was considerably higher than the amount approved;
b. the F-90 was not going to be produced and fielded within the stipulated timelines; and
c. the F-90 was not actually in-service and proven.

Defence considered the calibre of the future individual weapon. It was determined that it would remain the NATO standard 5.56 mm.

Interoperability was not held to be a risk.

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

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

How Defence considered through-life costs and issues

The introduction of the Modular Assault Rifle System - Light (MARS-L) rifle will reduce maintenance costs by comparison with the current Steyr. Ammunition costs (which are the largest consumable) remain constant.

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

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

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

The Whole of Life costs are calculated as follows:

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

*Discounted at 8% and useful life of 20 years

[15] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare, assess, and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best solution to acquire that will meet the capabilities required.

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

weapons		life of type, so allows for this. Within capital cost, does not utilise people and money managing a very large fleet, and maintaining unnecessary spares holdings, best manages life of type availability risk.	
ASSESSMENT: On the basis of benefit delivery, meeting of requirements and managing availability risk, the 8,800 individual weapons option was selected.			

Description of the Capability and Operational Requirements

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

Schedule of Capability Definition Phase

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

Expenditure of Capability Definition/Source Selection Phase

	Capital Expenditure (NZ$)	
	2015/16	$15,539,070
Explanation	Cabinet approved 0.440 M of pre- acquisition costs in May 2014 and $59.234 of capital expenditure in December 2015.	

History of Cost Estimates in the Capability Definition Phase

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

Estimates of Acceptance Date made in the Capability Definition Phase

Estimates	Initial Estimate	Estimate at contract signing	30 June 2016 Estimate	Actual
Date	March 2016	November 2016	November 2016	N/A
Explanation of variance	The final Cabinet approval was made in December 2015. Contract finalisation was at the beginning of 2016. Time has been allowed for robust quality assurance and acceptance measures.			

STRATEGIC BEARER NETWORK

Project Description: This project will provide Satellite Communications (SATCOM) equipment to the New Zealand Defence Force (NZDF). A number of mobile (land based) terminals, maritime terminals for the Navy and fixed anchor station terminals will be purchased. This SATCOM equipment will access the US Department of Defense (DoD) Wideband Global SATCOM (WGS) constellation enabling deployed forces to meet current and future strategic information exchange requirements (and meet the growing demand for bandwidth).

The WGS is a constellation of nine communications satellites with a full operational date of 2018/19. Seven of the satellites are operational in orbit now with the remaining two being launched over the next two years. The NZDF have gained access to the WGS constellation through a Memorandum of Understanding with the US DoD. This will provide a large increase in SATCOM capacity for the NZDF in return for funding a share of the build of WGS Satellite Nine and a share of the through life management costs.

Policy Value

Strategic Bearer Network (SBN) is an enabling project supporting a number of key NZDF functions across several capabilities including the Network Enabled Army programme, Defence Command and Control System, the P-3 Orions and the ANZAC frigates. This project will enable the Government's options for utilising the NZDF for the principal tasks set out in the Defence White Paper 2010, in particular:

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

Better Business Case Milestones

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 shortlist of capability options to the Detailed Business Case stage. May also authorise Defence to engage with industry for more detailed information (e.g. a Request for Information).

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 arrangements to manage the project and the ongoing delivery of services.

Date	Approved By	Approval
6 July 2011	Project Charter	**Project initiation.** Following the Defence White Paper requirement for "Improved Offshore Communications" the NZDF's Strategic Assessment and Investment Concept Brief identified a requirement to improve capacity and access to a wider range of common and reliable communications paths. A project charter to initiate the SBN project was approved "to provide global connectivity into the NZDF networks of sufficient capacity and reliability to enable deployed forces to meet information exchange requirements". The project team was directed to write the Indicative Business Case (IBC).
19 September 2011	Cabinet CAB Min (11) 9/4	**Approval of Indicative Business Case.** Following submission of the IBC to Cabinet approval was given to develop a Detailed Business Case (DBC) to examine the recommended three short listed options.

14 November 2011	Cabinet CAB Min (11) 41/13	**Approval of Detailed Business Case.** Following submission of the DBC, Cabinet confirmed the preferred option was through a Memorandum of Understanding (MoU) with the US DoD Wideband Global Satellite Communications System (WGS). The NZDF was authorised to sign the MOU and CDF signed this agreement on 4 December 2011. Cabinet also approved capital expenditure of $83.3m and a contingency of $5.6m totalling $88.9m. The preferred option was effectively contracted when the MoU was signed with the US DoD. This included the payment milestones required by the MoU. NOTE a percentage of the capital expenditure was set aside for investing in the NZDF infrastructure necessary to access the WGS satellites. This consists of mobile (land based) terminals, maritime terminals and fixed anchor stations. The NZDF was to administer the budget for the MoU, and the MoD was to administer the budget for infrastructure acquisition.
25 July 2012	Minister of Defence, Minister of Finance SBN financial appropriations	**Approval to Commit (joint note in lieu of a Project Implementation Business Case).** An appropriation of $18.31m to Vote Defence, Ministry of Defence for Defence Equipment was approved by Joint Ministers. (NOTE a further $14m for additional purchases in 2022-2025 has not yet been appropriated.) This equipment will be delivered over three tranches.
16 June 2014	Minister of Defence, Minister of Finance SBN financial appropriations	**Approval to Commit (joint note in lieu of a Project Implementation Business Case).** A technical adjustment was made to the existing appropriation to bring forward $8m of the out-year funding. (NOTE a further $6m for additional purchases in 2022-2025 has not yet been appropriated.)

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.

Summary of Capability Definition Phase

Capability Requirement: a description of the ability needed to achieve the policy objective.

Operational Requirement: a description of a component of what is required to complete a task.

How Defence identified and assessed capability and operational requirements

In 2010 Defence began formally considering options for replacing its strategic communications[16].

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

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

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

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

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

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

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

How Defence analysed the requirements options in the Capability Definition phase

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

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

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

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

- Known cost with reduced uncertainty.
- Delivers the capacity required of the NZDF model.
- Requires more capital expenditure up front but has significantly reduced through life costs.
- Reliable global access with redundancy built into the system.

How Defence considered interoperability[17]

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

How Defence considered through-life costs and issues

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

[17] For definition of interoperability see note under *Part 4A: Project Data Sheets*.

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

In terms of the infrastructure required to access the WGS satellites, the equipment suppliers are asked to provide their recommendations for through life support. The MoD and NZDF then agree on the approach to take. Typically this will include an up-front purchase of spares, warranty, operator and maintainer training and documentation and some form or through life support agreement.

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

A number of the WGS terminals will not last as long as the satellite constellation does. Estimates for mobile (land based) terminals range from 5 to 15 years but will be dependant on the frequency of their use and the conditions under which they operate. To this end a second round of infrastructure acquisition has been included in the years 2022 – 2025.

Requirements Analysis in the Capability Definition Phase

Options analysis in the capability definition phase is used as a tool to compare, assess, and evaluate capability and operational requirements.

Whereas options analysis in the acquisition stage identifies the best procurement solution to deliver the capabilities required.

Options assessed for delivering the SBN capability and operational requirements

Option	Cost estimates (NZ$ million)	Advantages	Disadvantages
Status Quo	87 - 144	• Achievable. • No change required. • Cheaper infrastructure. • Flexible.	• All missions continue to be managed in an ad-hoc fashion. • All bandwidth has to be purchased and all changes have to be negotiated. • As demand grows so do costs, particularly in congested areas. • Requires a mixture of contracts, equipment and suppliers. • Bandwidth provided to Defence is constrained by the budget available.
Enhanced Status Quo	71-128	• Achievable. • Centralised SATCOM Management and Control. • Cheaper infrastructure. • Flexible.	• Access to commercial SATCOM can be contended (demand is greater than supply and access becomes limited or very expensive). • Coverage may not be available (either there is no satellite in sight, or all available bandwidth has been sold). • May not meet future demand without further investment.

WGS MoU	112-114	• Achievable with known costs. • Capacity to meet future demand is included. • Guaranteed access. • Reliable, certified equipment. • Global access.	• High up front capital costs. • Committed to a single supplier. • More expensive infrastructure.
Hosted Payload (NZDF buys a portion of a satellites capacity)	200+	• High capacity. • Dedicated.	• Global coverage is not provided by one hosted payload (would need a payload on four satellites). • Unaffordable.
Non-satellite option	Less than WGS	• Less equipment to manage. • Not reliant on satellites.	• Does not meet bandwidth requirements and would not enable other defence projects.
Modified WGS MoU	More than WGS	• Greater customisation for NZDF.	• Due to the multi national nature of the MOU it was not able to be renegotiated .
ASSESSMENT	The WGS MoU option was recommended.		

Description of the Capability and Operational Requirements

Capability Requirements-The capability requirements necessary to support policy objectives include:
The key capability requirements: • Provide a computer network infrastructure with global reach, high capacity and robust design. • Enable the Command and Control of deployed forces. • Meet the growing demands for information exchange with our deployed forces. • Provide greater levels of interoperability with the NZDF single services and with our security partners. • Provide Value for Money from investment in SATCOM.

Operational Requirements- The operational requirements necessary to support the capability include:

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

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

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

Schedule of Capability Definition Phase

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

Expenditure of Capability Definition/ Source Selection Phase

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

History of Cost Estimates in the Capability Definition Phase

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

Estimates of Acceptance Date Made in the Capability Definition Phase

Estimates	Initial	Estimate at Contract Signing	30 June 2016 Estimate / Actual
Early Access	June 2013	August 2013	Early Access was delivered and accepted in August 2013.
Initial Operating Capability (IOC)	June 2014	June 2014	IOC was declared in September 2014. Delays have been in the development of support documentation and processes.

Full Operating Capability (FOC)	June 2015	December 2016	It may take longer than expected to have the maritime terminals installed and operational. Current estimates have the maritime terminals arriving in April 2016.
Explanation of variance	Delivery and customisation of documentation have taken longer than originally estimated. The selection and acquisition model for the maritime terminals plus their manufacture and delivery schedule is longer than expected.		

PART 4B: PROJECT INFORMATION SHEETS

DEFENCE COMMAND AND CONTROL SYSTEM

Introduction: The 2010 Major Projects Report included the Joint Command and Control System Programme. It reported that of the four projects identified in that programme, only the Defence Command & Control System Project had commenced, and that the other three were still in the concept stage.

On 18 July 2011, Cabinet cancelled the Joint Command and Control System Programme. It did so because the capability gaps identified in the 2008 Business Case, which were to be addressed by the three projects other than Defence Command & Control System, had significantly reduced. The previously agreed scope and structure of the Programme were therefore no longer appropriate.

Accordingly, this Project Information Sheet reports on the Defence Command and Control System Project only.

At the same time as the Cabinet decision, the lead for the acquisition of the Defence Command and Control System Project transferred from the Defence Force to the Ministry of Defence. Governance remains with a MoD/NZDF Capability Steering Group accountable to the Capability Management Board.

The project team engages closely with the NZDF's Command Information Systems (CIS) Branch and the NZDF Intelligence Community to progress and develop the project.

Description of acquisition work

As reported under "Next Steps" on page 194 of the 2010 Major Projects Report, it was concluded in June 2010 that:

- the Global Command & Control System - Maritime (GCCS-M) Version 4 supplied by the US Navy would meet the project's basic requirements for the Multi-Agency Network, operated by the National Maritime Coordination Centre (NMCC) in Wellington; and
- the results of the NMCC implementation would inform a decision on whether GCCS-M Version 4 could fulfil requirements on higher classification networks.

Because of uncertainties concerning access to GCCS-M V4, the project was originally managed in spirals, as follows:

- Spiral 1: the implementation of GCCS-M Version 4 including Intelligence features onto the Multi-Agency Network – Restricted at the NMCC National Maritime Co-ordinating Centre located at Headquarters Joint Forces New Zealand in Trentham.
- Spiral 2: the implementation of GCCS-M Version 4, including Intelligence features, onto the NZDF Secure Wide Area Network (SWAN).

Cabinet approved the adoption of GCCS-J on 29 October 2013, as the Maritime variant was no longer considered by Defence to be the optimum variant of the US Global Command and Control System (GCCS), for the whole of the New Zealand Defence Force. The project is now managed in phases as follows:

- Phase 1 : the pilot of GCCS-J at a small number of sites, and as ship trials.
- Phase 2: the rollout of GCCS-J across the New Zealand Defence Force.

GCCS-J provides systems for improving the effective command and control of Joint Forces of the New Zealand Military, and includes Integrated Imagery and Intelligence (I3).

Next Steps

The rollout of phase 2 has begun with the pilot to continue in parallel. Other remaining steps include the following:

- Complete the Navy approved permanent fit of GCCS-J on-board HMNZS *Te Mana*. Perform remediation to HMNZS *Te Kaha* and HMNZS *Canterbury*, to align these fitouts with *Te Mana*.
- Conducting a trial of the Global Lite application on-board HMNZS *Otago* during Operation Calypso in June, to prove its suitability as a solution for synchronising data from ships sensors into GCCS-J on smaller ships, such as offshore and inshore patrol vessels.
- Install limited GCCS-J functionality on to the other RNZN ships including inshore patrol vessels.
- Develop and build a deployable land GCCS-J system that can be used by deployed land elements of the NZ Army and RNZAF.
- Rectify Radiant Mercury capability gaps discovered during the pilot and OpEval.
- Complete implementing the remaining international data feeds.
- Complete the transfer of the MAN-R network to the Defence Information Exchange System.
- Complete phase 2 scoping and then rollout of GCCS-J clients across the New Zealand Defence Force.

It remains forecast that the project GCCS-J pilot and final phases will not complete before April 2017. Some ship fits may be later, depending on ship maintenance periods Full Operating Capability is forecast for June 2018.

PROJECT PROTECTOR REMEDIATION MULTI-ROLE VESSEL, OFFSHORE AND INSHORE PATROL VESSELS

Introduction: Through the Protector Remediation Project, Defence will remediate capability shortfalls and deficiencies which are present in the delivered vessels. Project Protector delivered a Multi-role Vessel (MRV), two Offshore and four Inshore Patrol Vessels (OPVs & IPVs). These vessels were acquired to perform a range of sealift and naval patrol tasks for the NZDF and civilian agencies. The ships were delivered with capability shortfalls and deficiencies that were subject to a mediation claim and settlement.

Background

The Project Team will manage the various work streams for the remediation programme.

The Remediation Project involves implementing changes on ships that are not only still completing Introduction Into Service programmes but also have active service commitments. A key challenge and risk for the Project Team will be to minimise periods of unavailability for the ships outside of routine maintenance and scheduled survey dockings. Babcock Fitzroy Limited will undertake many of the changes at the Devonport Naval Base under the existing dockyard management contract.

Canterbury is of particular focus, as it is the ship to which much of the implementation work is targeted, but also the vessel under the greatest operational demand. This is highlighted by the commitments to earthquake recovery operations in Christchurch, the 2009 tsunami relief efforts in Samoa, and the May/June 2010 Pacific Aid activity with the US Navy. Nevertheless, it is important that safety and capability issues with the ship are resolved. Such changes require the ship to be taken out of service for a period. Solutions will be implemented in a staged fashion, around the ship's operational commitments and maintenance periods, thereby minimising overheads, with programme completion projected to be in mid 2016. This will provide a controlled, efficient release of capability.

Description of acquisition work

Remedial Project Start-up and Phase One

Cabinet authorised Defence to undertake a two phase programme, on the basis that an efficient, prioritised programme would require a period of detailed planning and design work. Defence has assessed which remediation solutions and optimisations for *Canterbury* and the rest of the Protector fleet are priorities for implementation during Phase Two. Through Phase One Defence has scrutinised the costs of potential changes in relation to the level of benefit they provide and the amount of settlement funding that remains.

During the first phase, Defence:

- established a project team;
- produced design and feasibility studies; and
- embarked upon a range of changes to *Canterbury* to address immediate safety and capability issues.

The Phase One **design and feasibility studies** addressed complex issues that involve multiple ships' systems and for which a variety of solutions could be adopted. The work indicated that the remaining settlement funding should be sufficient to carry out all the priority changes during Phase Two.

Phase One also identified a range of changes to address **immediate safety and capability issues**. Solutions to these issues were identified, detailed designs for the solutions progressed, and any required physical changes scheduled for implementation. The changes include:

- relocation of *Canterbury's* sea boats from alcoves in the sides of the ship to higher locations ahead of the ship's flight deck;
- modifying *Canterbury's* engine lubrication system to ensure the ship is not at risk from engine-related issues in high sea states;
- remediation of *Canterbury's* echo-sounder to ensure the crew can get accurate information on the depths in which the ship is operating;
- remediation of *Canterbury's* landing craft to ensure that they can continue to be operated as part of the ship's core ship-to-shore transfer capability; and
- acquisition of monitoring tools that are to be used to ensure optimal use of the OPVs' Service Life Margins[18], and their ability to accept future capability upgrades.

While not included as part of the mediation settlement, the requirement for a helicopter approach control radar on *Canterbury* was incorporated into the Mission Systems work stream of Phase 2 of this project.

Identified work was implemented on the ships progressively through to early 2013, and overlapped with some scheduled changes to be carried out under Phase Two. Sequencing of the work was more efficiently and effectively conducted by aligning Phase One and Phase Two changes.

Phase Two Priorities

Phase Two involves the implementation of the prioritised list of physical changes that have been identified during Phase One. These changes have been undertaken by the Programme Team under six work streams. These work streams are outlined below.

Priority One: Sea-keeping

Defence will address a range of performance issues with the Protector fleet that can be generally categorised as sea-keeping issues (including hull performance, ship handling and stability).[19]

Canterbury's hull design presents challenges for operating in high sea states and is the primary source of many of the problems in operating *Canterbury.* It is not practical to modify *Canterbury's* hull, but the worst effects of the hull can be mitigated. Defence has undertaken mitigation work, including electronic systems to inform and advise commanding officers in

[18] "Service Life Margin" is an allowance to provide for weight growth to the ship through its life.

[19] Sea-keeping ability is a measure of how well suited a watercraft is to conditions when underway, and particularly the ability to operate in high sea states.

real time of the ship's performance and the addition of further ballasting. Conversion of current void spaces to ballast tanks will allow *Canterbury* to be loaded to the "load line" irrespective of cargo state.

In the case of the OPVs and IPVs, sea-keeping was not a mediation issue, but Defence has identified solutions that would provide the ships with additional safety and capability. Defence will carry out stability work on the OPVs, which will improve their stability in the icy conditions in which they may operate.

Priority Two: *Canterbury's* Ship to Shore Transfer system

This system provides *Canterbury's* core capability; getting personnel and equipment to and from shore. The system is complex and comprises methods and equipment to move and load landing craft, and then deliver their cargo to shore. Phase One provided interim changes to allow continued operation of the ship's current landing craft. Phase Two implemented more extensive, long-term solutions for maintaining and refining the system.

Priority Three: *Canterbury's* Mission Systems

Canterbury was delivered with a range of mission systems (software, displays, and controls) to provide situational awareness and allow the vessel to undertake taskings such as patrol. Some issues with these systems were covered in mediation, and other sub-optimal features have become apparent during operations. As a result Defence will remediate *Canterbury's* Obstacle Avoidance Sonar, Naval Gun System (MRV and OPV's) and Electronic Direction Finding Systems (Protector Fleet).

Priority Four: Aviation Integration on *Canterbury*

For Phase One, funding was allocated to complete design and feasibility work for the integration of the NZDF's new medium utility helicopter, the NH90, with *Canterbury*. Defence has designed a solution to integrate this capability, and will make required changes to *Canterbury* during Phase Two to deliver this solution. It requires optimisation of *Canterbury's* hangar spaces to ensure safe movement and transport of aircraft on the ship. The solution will also allow for the integration of the new training light utility helicopters (A109).

Priority Five: *Canterbury's* Medical Systems

The *Canterbury* has a spacious medical facility which, under Project Protector, has been outfitted with basic equipment in accordance with the capability requirements of the Contract, and can accommodate further portable equipment when needed. While not part of the mediation settlement, this space has been enhanced by the permanent outfitting of medical equipment. This investment will provide significant benefit, as it will provide better facilities available at immediate notice for medical tasking during disaster relief and other operations within New Zealand and throughout our region and globally.

Priority Six: Minor safety and compliance items

The mediation process provided resources to cover sundry safety and compliance items. There are several items that require remediation, including fuel and ammunition storage, security and fire protection. The resolution of these issues will increase the safety of the fleet.

NETWORK ENABLED ARMY TRANCHE ONE

Introduction: Network Enabled Army (NEA) Tranche 1 is to deliver modern communications to the land force units most often deployed by the Government – Special Operations Forces (SOF); and a land force committment of around 200 personnel, including infantry, a Task Group Headquarters and communications personnel. It is part of the wider NEA Programme.

Background

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

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 the front line soldiers and their commanders. It gives them the capabilities they need without burdening them with unnecessary equipment and capability. It allows for expansion and development over time.

The strategic benefits of the NEA Programme are:

a) better communication between widely dispersed units;

b) better and faster tactical command decision making;

c) effective situational awareness for commanders and soldiers;

d) reduced risk for our soldiers, friendly forces and civilians; and

e) more ability to operate effectively with partners.

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.

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

Tranche One has capital costs of up to $106.0 million and operating costs of $36.4 million over the next four years.

Description of acquisition work

In April 2015, Cabinet approved the NEA Tranche One Project funding for new digital radios and associated equipment as part of the Network Enabled Army programme [CAB Min (15) 11/7 refers].

Tranche One comprises five related capability sets, as summarised below:

2. Integration, Testing, Training, Evaluation and Experimentation

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

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.

3. 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 in essence be a deployable node of the Defence Information Environment.

Tendering for ruggedised deployable server hardware to be evaluated during a pilot has commenced. Acquisition of deployable wideband satellite communication terminals has commenced using the United States Government Foreign Military Sales processes. This is well advanced.

4. Common Command Post Operating Environment (CCPOE)

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

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

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

c. the command post infrastructure, including shelters, generators, environmental management and furniture. Tendering for the pilot suite of infrastructure is well advanced.

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

5. Mobile Tactical Command Systems (MTCS)

The MTCS capability consists of enhanced network-capable digital combat radios, 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.

Acquisition of a limited range of network-capable combat radios for pilot evaluation has commenced through the United States Government Foreign Military Sales process.

6. Special Forces Electronic Warfare Refresh

This particular capability is being handled as an Urgent Operational Requirement, with the NZDF Defence Capital Acquisitions staff undertaking acquisitions. The required systems have been purchased, tested and introduced into service. Operational testing and evaluation has been conducted and the project will begin the project closure stage in the second half of 2016.

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, mitigate risk, allow advantage to be taken of ongoing technical developments, and 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 NZ'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 $m
Integration, testing, training, and evaluation	Programme Services	11.4
Mobile satellite terminals, routers, and servers	CUBS	27.9
Headquarters equipment and full network software	CCPOE	13.1
Mobile Tactical Radios	MTCS	48.4
Special Forces electronic warfare refresh	NZDF UOR	5.2
Total		106.0