Defence Frigate Systems Upgrade: Additional Funding

January 2025

This publication provides the 2017 Cabinet decision to commit an additional $148 million of capital expenditure to cover the higher than estimated cost for installation of the Frigate Systems Upgrade.

The pack comprises the following documents:

- The December 2017 Cabinet paper and associated Minute of Decision *Defence Frigate Systems Upgrade: Additional Funding [CBC-17-MIN-0037 and CBC-17-SUB-0037]*

This pack has been released on the Ministry of Defence website, available at: www.defence.govt.nz/publications.

It has been necessary to withhold certain information in accordance with the following provisions of the Official Information Act 1982. Where information is withheld, the relevant sections of the Act are indicated in the body of the document. Where information ahs been withheld in accordance with section 9(2) of the Act, no public interest has been identified that would outweigh the reasons for withholding it.

Information is withheld where making it available would be likely to prejudice:

- the security or defence of New Zealand or the international relations of the Government of New Zealand [section 6(a)]

Further information is withheld to protect:

- information that would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information [section 9(2)(b)(ii)]
- information which is subject to an obligation of confidence, where making the information available would be likely to prejudice the supply of similar information or information from the same source [section 9(2)(ba)(i)]
- the free and frank expression of opinions [section 9(2)(g)(i)]

Cabinet Business Committee

Minute of Decision

Defence Frigate Systems Upgrade: Additional Funding

Portfolio Defence

On 6 December 2017, the Cabinet Business Committee:

Background

1 **noted** that in August 2008, the previous Labour-led government agreed that five options to replace the ANZAC frigates' existing self defence systems, in order to address equipment obsolescence and emerging threats facing the ANZAC frigates, be full developed for a main gate business case [POL Min (08) 14/16];

2 **noted** that in November 2012, the previous government approved upgrades to air, surface and underwater defensive and surveillance systems, at an indicative capital cost of $354-$374 million and authorised the Secretary of Defence to issue Requests for Tender [CAB Min (12) 40/5A];

3 **noted** that in April 2014, the previous government:

3.1 noted that of five tenders received, the proposal from Lockheed Martin Canada (LMC) provides the best value for money and lowest risk;

3.2 agreed to proceed with the Frigate Systems Upgrade (FSU) as described in the Implementation Business Case;

3.3 authorised the Secretary of Defence to conclude a contract with LMC;

3.4 approved $426.193 million capital expenditure for the acquisition and introduction of service of the Frigate Systems Upgrade and an additional $20 million capital as special contingency against risk in the design and implementation stages of the FSU;

[CAB Min (14) 13/14]

4 **noted** that in April 2017, the previous government noted that Defence have identified that the installation costs in the FSU project business case were based on inaccurate estimates and that the FSU project is expected to require an additional $70 to $100 million funding to complete [SEC-17-MIN-0020];

5 **noted** that the two ANZAC frigates provide the Government with a highly valued maritime capability that can operate across the spectrum of military and national security tasking, and are one of three high end military capabilities the Defence Force maintains, along with maritime patrol aircraft and Special Forces;

6 **noted** that, at the time of Cabinet approval in 2014, Defence officials underestimated the cost of the FSU project by deriving these costs from an inaccurate third party estimate for the installation phase of the project;

7 **noted** that, in September 2016, Defence advised Ministers that additional funding would be required to complete the project, and that further analysis during the detailed design phase would be required to provide certainty of the amount of additional funding required and the options available for addressing the issue;

8 **noted** that a series of cost estimates and draft Cabinet papers were provided to the previous Minister of Defence over the period of September 2016 and August 2017 as costs were further refined by officials in negotiations with Lockheed Martin Canada;

9 **noted** that following completion of the detailed design phase in June 2017, Lockheed Martin Canada provided a fixed firm price for installation that was valid until 11 August 2017 for installation to begin in October 2017, and that would have taken the total project cost to $631 million, $140 million above the current appropriation;

10 **noted** that Defence officials prepared a Cabinet paper in early August 2017 based on the fixed firm price for installation received in June 2017, but this paper was not progressed;

s9(2)(g)(i)

12 **noted** that the current fixed firm price for installation provided by Lockheed Martin Canada remains valid until 22 December 2017, and will, if accepted, increase the total project cost to $639 million, $148 million above the current appropriation;

13 **noted** that the Ministry of Defence and New Zealand Defence Force have strengthened their project teams with substantive expertise as part of a significant change process to improve Defence's management of capability projects, and appointed a dedicated project boards to oversee this and other major projects and to provide in depth governance;

Completing the frigate upgrade

14 **noted** that Defence has investigated potential options to address this cost overrun and, given the important role of the frigates, the preferred option is to contract Lockheed Martin Canada to complete the project within its current scope;

15 **noted** that an independent study confirmed that Lockheed Martin Canada, s9(2)(ba)(i) have the most relevant expertise to install the systems on the frigates and their costs remain competitive in the current market;

16 **noted** that Defence's assessment is that the potential savings resulting from approaching market for an open tender would be outweighed by the significant costs, risks and delays associated with a tender process;

17 **agreed** that the original scope of the FSU be retained and the project be completed as planned;

18 **authorised** the Secretary of Defence to contract Lockheed Martin Canada to complete the final phase of the FSU project;

19 **noted** that Budget 2017 set aside $301.651 million in a tagged contingency for Defence capabilities signalled in the Defence White Paper 2016, which included $251.416 million for the Littoral Operations Support Capability project;

20 **agreed** that the additional funding required to complete the FSU is funded by a reduction in the scope of the Littoral Operations Support Capability project from a littoral operations support vessel to a dive and hydrographic vessel;

21 **directed** Defence to report back to Cabinet by July 2018 with costed options for a dive and hydrographic vessel;

Financial implications

22 **approved** the following capital injection to the New Zealand Defence Force to give effect to the decision in paragraphs 17 and 18 above, with a corresponding impact on debt:

	$m – increase/(decrease)				
	2017/18	2018/19	2019/20	2020/21	2021/22 & outyears
New Zealand Defence Force Capital Injection	10.209	63.358	71.964	2.469	-

23 **agreed** that the capital expenditure incurred under paragraph 22 above be a charge against the Defence White Paper 2016 (DWP 2016) – Contingent Capital Funding tagged contingency, established as part of Budget 2017;

24 **noted** the following changes to appropriation in accordance with the New Zealand Defence Force – Capital Expenditure PLA authorised by section 24(1) of the Public Finance Act 1989, reflecting the forecast increase in costs to deliver the Frigate Systems Upgrade, with a corresponding impact on debt;

Vote Defence Force Minister of Defence	$m – increase				
	2017/18	2018/19	2019/20	2020/21	2021/22 & outyears
Departmental Capital Expenditure: New Zealand Defence Force - Capital Expenditure PLA	10.209	63.358	71.964	2.469	-

25 **approved** the following changes to appropriations to give effect to the decisions in paragraphs 17 and 18 above:

	$m – increase/(decrease)				
Vote Defence Minister of Defence	2017/18	2018/19	2019/20	2020/21	2021/22 & outyears
Non departmental Capital Expenditure Defence Equipment	10.209	63.358	71.964	2.469	-

26 **authorised** the Secretary of Defence to commit and approve additional expenditure of public money up to the amount of $148.000 million for the FSU project;

27 **noted** that the costs in paragraph 25 are offset by a capital receipt from the New Zealand Defence Force, with no impact on net debt;

28 **agreed** that the proposed changes to appropriations for 2017/18 be included in the 2017/18 Supplementary Estimates and that, in the interim, the increase be met from Imprest Supply;

29 **authorised** the Minister of Finance and the Minister of Defence to jointly approve expenditure of public money up to the amount of $20.000 million as contingency for the installation stage of the FSU project, with the closure of the contingency no later than the acceptance of Ship 2, expected in May 2021;

30 **noted** that foreign exchange risks for the cost of the project will be managed through the forward purchase of currency once approval to proceed has been received;

31 **noted** that officials may recommend changes in the level of funding for Defence to offset any significant change in the cost of this investment as a result of foreign exchange rate movement prior to the signing of the contract;

32 **agreed** to extend the expiry of the tagged contingency Defence White Paper 2016 (DWP 2016) – Contingent Capital Funding to 30 June 2019 to allow for consideration of options to procure a dive and hydrographic vessel.

Rachel Clarke
Committee Secretary

Present:
Rt Hon Winston Peters (Chair)
Hon Kelvin Davis
Hon Grant Robertson
Hon Phil Twyford
Hon Dr Megan Woods
Hon Dr David Clark
Hon David parker
Hon Nanaia Mahuta
Hon Stuart Nash
Hon Tracey Martin
Hon Damien O'Connor
Hon Ron Mark

Officials present from:
Office of the Prime Minister
Department of the Prime Minister and Cabinet

Hard-copy distribution:
Minister of Finance
Minister of Defence

Office of the Minister of Defence

Chair, Cabinet Business Committee

DEFENCE FRIGATE SYSTEMS UPGRADE - ADDITIONAL FUNDING

Proposal

1. This paper seeks approval to commit an additional $148 million of capital, already provisioned in Budget 2017 for the Defence portfolio, to cover the higher than estimated cost for installation of the Frigate Systems Upgrade. No new money is required. The additional cost is able to be funded by reducing the scope of the Littoral Operations Support Capability project (which will replace the dive tender HMNZS *Manawanui*).

Executive Summary

2. New Zealand's two ANZAC-class frigates provide the Government with a maritime capability that can operate across the spectrum of military and national security tasks, from constabulary and humanitarian operations, to combat roles as part of a multinational coalition. The frigates allow New Zealand to protect its own interests, its military assets, and to contribute meaningfully to global operations with coalition partners. Our frigates have performed well in a variety of coalition missions s6(a) and where they have contributed to wider foreign policy objectives. They are one of three high end military capabilities the Defence Force maintains, along with P-3 maritime patrol aircraft and Special Forces.

3. The two frigates were commissioned in 1997 and 1999 respectively, and are expected to remain in service until around 2030. A series of upgrades and refits have been essential to maintain their effectiveness. Three of five upgrades have been completed or are nearing successful completion: the Frigate Systems Upgrade and a communications refresh remain.

4. The Frigate Systems Upgrade is the largest upgrade, designed to maintain the ships' surveillance, combat, and self-defence capabilities through to their end of life. Three business cases underpin the final investment decision by Cabinet in 2014 [CAB Min (14) 13/14 refers], with total capital funding after a foreign exchange adjustment of $491 million.

5. The detailed design of the new systems is completed and the requisite equipment has been manufactured and awaits installation. A total of $369 million has been committed to date, within the original budget.

6. The fixed firm price for installation is higher than budgeted, and completion of ship installation has been delayed until the way forward is agreed.

7. The cost of installation has been problematic. At the funding approval point in April 2014 it was clear that the detailed design (part of the funding approval) was required before the installation cost could be reliably determined. The project team provided an installation cost estimate of $39 million derived from an extensive study by industry s9(2)(b)(ii) at the time of

Cabinet approval but the estimate has proved to be inaccurate. A contingency for installation cost was allocated but it has also proved to be inadequate.

8. Defence also discounted an additional installation cost estimate that was received just prior to the Cabinet decision in 2014. Lockheed Martin Canada, the Prime System Integrator, s9(2)(ba)(i) . s9(2)(g)(i) This estimate, however, has proven to be much more accurate than the installation estimate provided to Cabinet in 2014.

9. Defence officials first became aware of issues with the installation phase of the project in March 2016, and informed the Minister of Defence of this issue in September 2016. This followed a review of costings, risks and assumptions. At this stage, the potential funding shortfall for the project was estimated at between $65 - 74 million. This figure was used in a draft Cabinet Paper prepared by officials.

10. Detailed work on costings for the installation phase was completed by Defence and Lockheed Martin Canada from September 2016 to June 2017. The overall budget shortfall within the project increased across this period to an estimated $89 million by January 2017, to between $102 – 122 million by March 2017, and to $128 million by May 2017.

11. In March 2017, a draft Cabinet Paper to seek approval for funding to mitigate the cost increase was produced by officials, but not progressed. The opportunity to progress the issue through the Budget round for Budget 17 was considered, but not pursued.

12. Defence received a fixed firm price for installation from Lockheed Martin Canada in June 2017, against which it was determined that the project was facing an overall budget shortfall of $140 million. This offer was valid until 11 August 2017. s9(2)(g)(i)

13. The fixed firm price from June has now been revalidated to reflect the delay in installation and a refreshed offer provided by Lockheed Martin Canada in October 2017. Following a quantitative risk assessment, the total project cost is $639 million, $148 million above the current appropriation.[1]

14. Lockheed Martin Canada's price is valid until 22 December 2017, based on availability of their shipyard in May 2018. To secure this shipyard space and avoid any further cost increases, a contract needs to be signed with Lockheed Martin Canada by 22 December.

15. If a decision is delayed, the next opening in the shipyard could be as late as the first half of 2019. Costs would increase by a projected $20 million. The acquired equipment would also need to be warehoused for a longer period, and warrantees may expire or be significantly run down prior to installation. The introduction of the new capabilities would be deferred, limiting the contribution New Zealand is able to make to maritime operations s6(a)

16. For these reasons, Cabinet is asked to make a decision on additional funding before the end of the year.

17. Defence has investigated potential options to redress the funding issue:

A. not proceeding with the upgrade and continuing to operate the frigates in their current state;

[1] This figure includes a non-cash expense of $45 million which is a technical adjustment related to foreign exchange. It has no impact on government net debt.

B. reducing the scope of the project;

C. proceeding to contract Lockheed Martin Canada to complete the project as planned;

D. competitively tendering the installation phase; and

E. not proceeding with the upgrade and purchasing new frigates now.

18. Given the importance of the frigates to New Zealand's national security, I recommend that Cabinet agree to proceed with Option C.

19. Option C is the option representing the least risk, with the least impact on the delivery schedule. This would allow Defence to contract Lockheed Martin Canada to undertake the installation phase with no reduction in scope. An independent study conducted by s9(2)(b)(ii) concluded that Lockheed Martin Canada and its subcontractor s9(2)(ba)(i) have the most relevant experience to complete the upgrade and their costs remain competitive in the current market. s6(a)

20. Option C can be funded from within the capital funding already set aside for the Defence portfolio in Budget 2017. Defence officials analysed a number of trade-off options across the portfolio, including a reduction in all other Defence projects. The reprioritisation of funding allocated to the Littoral Operations Support Capability project ($148 million of a $251 million capital provision) is the most viable solution with the least impact on force structure and capabilities.

21. The remaining provision for the Littoral Operations Support Capability project ($103 million) is sufficient to acquire a modern, second-hand, dive and hydrographic vessel to replace HMNZS *Manawanui*, which is due to retire in February 2018. This would allow the Defence Force to enhance its current capabilities by providing a platform for diving, hydrography, underwater search and recovery, salvage, and other activities, in support of other government agencies around New Zealand and in the South Pacific.

22. This approach could also see a capability introduced in 2019, reducing the forecasted capability gap between the *Manawanui's* February 2018 retirement and the projected introduction of the full Littoral Operations Support Capability in 2022. Approval for the dive and hydrographic vessel would be sought in mid-2018. Cabinet would retain the flexibility to reconsider a more capable Littoral Operations Support Capability solution at a future date.

23. If Cabinet agrees to proceed with the Frigate Systems Upgrade (Option C), Ship 1 would commence installation by May 2018 (nearly a year later than the current milestone) and could be ready for tasking from May 2020. Ship 2 would begin installation around May 2019, and could be ready for tasking by May 2021.

s6(a)

Background

Strategic importance of New Zealand's Naval Combat Force

25. The Defence Force's Naval Combat Force consists of two ANZAC-class frigates HMNZ Ships *Te Mana* and *Te Kaha*, together with embarked Seasprite helicopters and a replenishment tanker.[2] The frigates provide the Government with a maritime capability that can operate across the spectrum of military and national security tasking, from constabulary and humanitarian tasks to combat roles as part of a multinational coalition. The frigates fulfil roles that could not be performed by the Defence Force's non-combat ships. They enable New Zealand to protect its own military assets and interests and also to contribute meaningfully to coalition maritime operations. They are one of three high end military capabilities the Defence Force maintains, along with P-3 maritime patrol aircraft and Special Forces.

26. Our frigates have performed well in a variety of coalition missions s6(a) In this capacity, the frigates have provided the Government with a credible capability to support international operations globally. s6(a)

27. The frigates have supported peacekeeping operations in our region where there has been the possibility of an escalating threat level, such as in Bougainville, East Timor and the Solomon Islands. The 2016 Defence White Paper stated that the Defence Force is likely to undertake a major operation in the South Pacific in the next ten years of a similar nature to the East Timor response. The frigate capability would be an essential component of such a response.

28. The frigates have also contributed to coalition efforts such as counter terrorism operations in the Arabian Gulf and Gulf of Oman, and counter narcotic and counter piracy operations off the Horn of Africa and in the Indian Ocean. Most recently, *Te Kaha* was deployed to support the United States Seventh Fleet Nimitz Carrier Strike Group, after the USS *Fitzgerald* sustained damage from a collision with a Philippine-flagged container ship.

29. Following consideration of the 2016 Defence White Paper, Cabinet approved an updated force structure to maintain the Defence Force's flexibility and depth of capability to meet future security requirements. The Cabinet Paper supporting that decision noted that the naval combat capability would remain crucial to undertaking the Defence Force's directed roles and tasks [CAB-16-MIN-0219].

Mid-life upgrades to maintain the frigates' capabilities

30. The ANZAC-class frigates, although delivered in the 1990s, were conceived and designed in the late 1980s and were built with systems from that era. The government of the day agreed to collaborate with Australia on the acquisition of the new frigates, which were built in Australia with significant New Zealand industry involvement. Construction of *Te Kaha* started in 1994 and the ship was commissioned in 1997. *Te Mana* was then commissioned in 1999.

31. New Zealand is undertaking a series of mid-life upgrades to replace the obsolescent, original systems and maintain the frigates' capabilities until they are retired in around 2030. Australia, the United Kingdom and Canada have all undertaken similar mid-life upgrades on their frigates. This approach is complex as it involves removing, redesigning and replacing core equipment and systems. It is more cost effective, however, than purchasing

[2] The replenishment tanker HMNZS *Endeavour* is currently being retired, to be replaced by the new tanker, Aotearoa, in 2020.

new frigates. It allows value to be obtained from long-life components such as hulls and platform systems that have significant lifespan remaining. It also allows new capability to be fielded quickly.

32. Five mid-life upgrade projects have been planned for New Zealand's frigates. See Annex B for more information on the history of the frigates and upgrade projects. Three have been successfully concluded or are close to completion:

(i) Phalanx Close-In Weapon System Upgrade, to maintain a discrete defensive weapons system on the frigates that provides a final layer of protection against in-bound missile and fast inshore attack craft threats ($22.3 million) [CAB Min (07) 18/3];

(ii) Platform Systems Upgrade, focused on the replacement of propulsion diesel engines, upgraded cooling and provided new platform management and integrated bridge systems ($86.1 million, from an original budget of $57.6 million) [CAB Min (07) 42/3 and CAB Min (14) 13/4]; and

(iii) Maritime Helicopter Capability, to provide an embarked helicopter for the vessels that can provide rotary wing surveillance, warfare and airlift ($242.2 million) [CAB Min (13) 12/12].

33. A business case for the final mid-life upgrade, the ANZAC Communications Upgrade project, to maintain the communications capability of the frigates, is currently under development. It has a provision of $50 million in the Budget 2017 Defence Force tagged contingency. The business case will be presented to Cabinet in 2018.

34. The Frigate Systems Upgrade is the largest of the mid-life upgrade projects. It will maintain the surveillance, combat and self-defence capabilities of the frigates. This includes replacement of the combat management systems and a number of sensor and weapon systems.

35. The project was considered by Cabinet in three stages, with a business case informing decision-making at each stage[3]:

(i) In August 2008, Cabinet was advised, based on an Indicative Business Case, that the ANZAC frigates were over ten years old and that many of the surveillance and combat systems were becoming obsolete and in need of replacement. Cabinet directed officials to complete a Detailed Business Case developing a range of options to address these issues [POL (08) 220 and CAB Min (08) 31/4 refer].

(ii) In November 2012, following completion of the 2010 Defence White Paper, Cabinet accepted the option from the Detailed Business Case with an estimated cost of $354-375 million. This would enable the frigates to play a credible and effective role, and be deployed with confidence against threats in the Asia-Pacific region and similar threats elsewhere, s6(a) Cabinet authorised the Secretary of Defence to issue a request for tender for the upgrade [CAB Min (12) 40/5A refers].

(iii) In April 2014, Cabinet agreed to proceed with the Frigate System Upgrade at an estimated cost of $446 million, after consideration of the Implementation Business Case. The increase in cost from the Detailed Business Case related to the

[3] For large or complex projects across all government investment areas, Cabinet's expectations have been for a series of three business cases, of increasing detail, to underpin decision-making: (i) Indicative Business Case to test the concept and undertake a cost-benefit analysis for investment; (ii) Detailed Business Case to select the preferred option; and (iii) Implementation Business Case to underpin the approval of funding.

decision to utilise a Prime Systems Integrator to reduce risk, an increase in the cost and capability of the electronic surveillance system and updated accounting policies that capitalised personnel costs. Cabinet authorised the Secretary of Defence to conclude contracts with Lockheed Martin Canada and other suppliers [CAB Min (14) 13/14 refers]. Subsequent to this decision a non-cash technical adjustment (foreign exchange) was approved, bringing total project funding to $491 million. This last adjustment has no impact on government net debt.

Structure of the Frigate Systems Upgrade

36. A key decision taken at the time Cabinet approved the Frigate Systems Upgrade was to structure its delivery into three phases: (i) design; (ii) purchase of systems and equipment; and (iii) installation and integration of the systems and equipment onto the frigates.

37. Defence selected Lockheed Martin Canada as the Prime Systems Integrator on the basis of its experience with a similar but more complex upgrade of the Canadian Halifax class frigates.[4] Defence contracted the company to deliver the first two phases of the project. The design phase has concluded and the majority of the equipment and systems to be installed on the frigates have been manufactured, both within the estimated budget. A total of $369 million is estimated to have been spent or committed to date.

38. The contracted deliverables with Lockheed Martin Canada included physical integration and testing services following the installation phase, but did not include the installation of equipment and systems on the frigates. Lockheed Martin Canada was to provide a fixed firm quote to deliver this phase once the final design had been completed. This has now been received.

Installation costs are higher than estimated

39. Defence officials first became aware of issues with the installation phase in March 2016, and informed the Minister of Defence of pressures on the installation budget in September 2016, following a review of costings, risks and assumptions. At this point, the increase in installation costs led to an estimated project budget shortfall of $65 - 74 million. This estimate was used in a draft Cabinet Paper prepared by officials in September 2016.

40. Detailed work on costings for the installation phase was completed by Defence and Lockheed Martin Canada across the period from September 2016 to June 2017. Cost shortfalls within the project increased to estimated $89 million in January 2017, as the detailed design phase of the project progressed.

41. The Minister of Defence was kept updated on changes to installation cost figures across the planning cycle for Budget 17. A Budget bid as part of the Budget round to mitigate the cost pressure issue was not pursued.

42. s9(2)(g)(i) A further cost estimate was provided to the Minister of Defence in May 2017, during the final phase of detailed design, which recorded a figure of a $128 million shortfall in the overall project budget. This figure was based on the first frigate starting its upgrade in July 2017.

43. Following completion of the design phase, Lockheed Martin Canada was then able to determine a fixed firm price for nearly all of the remaining installation and physical

[4] The use of Lockheed Martin Canada as a Prime System Integrator was based on lessons learned from the Platform Systems Upgrade. It mitigates risks from the Crown acting as an integrator and intermediary between equipment supplier, installation designer and installation shipyard.

integration costs.[5] This price was received in June 2017 and was based on the first frigate starting its upgrade in October 2017. This offer had an expiry date of 11 August 2017. The overall project budget shortfall, based on this offer, was estimated at $140 million. The Minister of Defence was provided with this estimate in July 2017.

s9(2)(g)(i)

45. The fixed firm price from June has now been revalidated to reflect the delay in a decision on installation, and a subsequently refreshed offer provided by Lockheed Martin Canada in October 2017. This offer is based on installation of equipment beginning of the first frigate in May 2018.

46. Based on a quantitative risk assessment, Defence now estimates the final project cost shortfall will be $148 million s9(2)(g)(i) above the current funding approved by Cabinet (see Table 1). This figure is based on foreign exchange rates as at November 2017.

Table 1: Frigate Systems Upgrade Project - Current Estimated Costs

	NZD million – increase/(decrease)
Current appropriation	491
Technical adjustment for forex	(45)[7]
A. Original appropriation	**446**
Actual and committed expenditure	369
Estimated remaining costs:	s9(2)(g)(i)
- Installation fixed firm price	
- Installation costs yet to be contracted	
- Project management costs	
- New contingency	
B. Estimated total expenditure	**594**
C. Estimated shortfall (B - A)	**148**

Causes of the installation cost shortfall

47. The increase is due to installation costs being underestimated in the Project Implementation Business Case presented to Cabinet in April 2014. The original estimate of $39 million was derived by the project team from a detailed analysis commissioned by Defence from s9(2)(b)(ii) in November 2013.

48. Just prior to the Cabinet decision, in April 2014, Defence also s9(2)(ba)(i) Prime System Integrator, Lockheed Martin Canada. This estimate, however, was discounted as it was considered to be based on broad assumptions and lacking supporting evidence, in contrast to the estimate based on the s9(2)(b)(ii) study. In hindsight, the

[5] The cost of one minor work package is outstanding. It relates to the internal communications systems and relocation of an ammunition storage compartment.

[6] s9(2)(g)(i)

[7] This figure is a non-cash expense of $45 million which is a technical adjustment related to foreign exchange. It has no impact on government net debt.

Lockheed Martin Canada cost was realistic and should have been taken into consideration.

49. The uncertainty in the installation cost was recognised in the Cabinet decision as the highest project risk but the magnitude of the contingency provisioned was inadequate.

50. Other factors impacting on installation cost increases relate to changes made in the preliminary design phase, including:

s6(a)

s9(2)(g)(i)

Incorporating lessons learned

52. All upgrades to the Defence Force's older platforms have proved complex and problematic. Legacy projects such as the upgrades to the Defence Force's C-130 Hercules and P-3K2 Orion aircraft have involved significant delays, as have previous naval projects. This is not a New Zealand-specific issue, but Defence upgrade programmes have faced delays and overruns internationally. Consequently, Defence and public sector agencies have reviewed extensively the performance of such projects in recent years.

53. In response to critical reviews and an expanding portfolio of large and complex Defence projects, Cabinet agreed in Budget 2015 to increase the investment made in the Ministry of Defence to allow Defence to address errors in the management of these types of projects. For the Frigate Systems Upgrade and other projects more generally, this has seen an increase in the size, expertise and experience of project teams. The Ministry has also increased the number of specialist staff in procurement, finance, risk management, and project management office areas to support these teams.

54. Defence has made extensive changes to transform executive management oversight, governance, and assurance of all projects through individual project boards for major projects. These dedicated project boards now include external members. The Frigate Systems Upgrade project has one of these boards to provide additional in-depth governance.

55. Defence has a programme of work well underway to strengthen the systems, practices, tools and procedures underpinning its procurement system. These involve fundamental changes to the business operating model based on lessons learned and international best practice.

56. In addition, the Secretary of Defence has directed that a different acquisition strategy be adopted for large platform upgrades. This will involve seeking funding to first undertake detailed design, from which accurate estimates can be made before committing to the full project cost. Further funding would then be sought for the acquisition of the systems and installation. This will provide off-ramps before the full cost has been committed.

57. Future Defence replacement projects are also likely to include a cost-benefit analysis of options that provide for incremental upgrades to systems as opposed to the historic practice of large-scale, mid-life upgrades.

Options to remediate the Frigate Systems Upgrade project

58. Defence officials have analysed options to address the cost overrun. These are:

(i) Option A – Stop project: The upgrade would be cancelled. The frigates could continue in service until around 2020, when their systems are predicted to degrade to the point of very limited overall combat capability and no viable air defence capability. After that point they could undertake non-combat tasks, be used as general patrol and training vessels or sold. This would compromise the Royal New Zealand Navy's ability to maintain its naval combat capability even if replacement of the frigates was brought forward.

(ii) Option B – Reduce the scope of the project: Defence has undertaken detailed analysis on the potential to remove one or more systems from the scope of the upgrade to reduce costs. A number of systems were considered non-discretionary from a health and safety perspective. The remaining systems allow the frigates to s6(a) Removing one of these systems would s6(a) reducing their benefits to Government. Cost reductions in this area are assessed at around s6(a). There is potential to remove the Communications Electronic Support Measures system from scope at a potential saving in installation costs of up to s6(a). However, in the event that this option is pursued, it would be necessary to write down the investment made in associated equipment purchases of around s6(a). Given the substantial reduction in project benefits, together with the fact that this system is considered essential for self-defence, this option is not preferred.

(iii) Option C – Proceed to contract Lockheed Martin Canada to deliver the installation phase: The project would be completed as planned, maintaining the capability of the frigates until their end of life in around 2030. Approval of this option would allow contract signature for the installation phase by 22 December 2017, ensuring a start date for installation from May 2018. Compared to Option D, it would reduce overall project costs by minimising risks, delays and related costs, including foreign exchange exposure, and would allow the project benefits to be delivered earlier.

(iv) Option D – Competitively tender the installation phase: Defence commissioned an independent report by s9(2)(b)(ii) to assess this option. Their report found that Lockheed Martin Canada, and s9(2)(ba)(i), had the most relevant recent expertise in this type of upgrade and their costs remain competitive in the current market. Defence's assessment is that any savings that may result from approaching market for an open tender would be outweighed by the significant costs, risks and delays associated with a tender process. These costs include project overheads, legal costs, design rework, freighting equipment to a new shipyard, and potential additional systems integration costs. Annex A provides more detailed information on this option.

(v) Option E – Purchase new frigates: In the current market the cost for two frigates with the required capabilities is around s9(2)(g)(i), with an earliest estimated delivery date of 2025. The current Defence Capital Plan places this purchase in

2027 – 2030. Bringing this expenditure forward would not be possible in the current plan.

59. Given the importance of the frigates to New Zealand's national security, and based on value for money considerations, I recommend Cabinet approve Option C and authorise the Secretary to conclude a contract with Lockheed Martin Canada to allow installation to commence in May 2018.

Financial Implications

60. Analysis during the 2016 Defence White Paper process ranked the relative benefits of the naval combat capability as the second highest within the preferred Defence Force structure, second only to maritime sealift. The other naval project considered, the Littoral Operations Support Capability, fell at the lower end. Given the strategic importance of the frigates to New Zealand, the priority would be completion of the Frigate Systems Upgrade, over the impact of a deferred or reduced scope of the latter project.

61. I recommend the shortfall in funding for the Frigate Systems Upgrade is, therefore, managed through a trade-off of $148 million of capital funding from the Littoral Operations Support Capability. Budget 2017 set aside $302 million in capital for Defence capabilities signalled in the Defence White Paper 2016. This includes $251 million for the Littoral Operations Support Capability project.

62. The additional $148 million includes a contingency of $26 million. Joint Ministers would continue to hold $20 million of the contingency, as agreed when Cabinet approved the project in 2014 [CAB Min (14) 13/14 refers].

Impact of trade-off on Defence capabilities

63. The current indicative capital funding track for Defence capabilities is based on the force structure described in the Defence White Paper 2016. Managing the additional cost within this track has capability implications.

64. Defence analysed a number of different capability trade-offs amongst projects with funding allocated in the same period that the Frigate Systems Upgrade installation costs fall. This work found that reprioritising funding from the Littoral Operations Support Capability project would have the least impact on overall Defence capability. Other options were considered, including reducing project budgets across several other projects. These were judged to have a more adverse overall impact on the capability portfolio either directly or indirectly through project dependencies.

65. Cabinet authorised the Secretary of Defence to issue a request for tender for a littoral operations support vessel to replace the retired hydrography ship *Resolution* and dive ship *Manawanui* [CAB-16-MIN-0313 refers] in July 2016. This reflected the decision on the preferred force structure outlined in the Defence White Paper 2016. The Defence Capital Plan makes provision for $251 million for the project.

66. Defence is confident a suitable dive and hydrographic vessel can be funded within the remaining allocation for the Littoral Operations Support Capability project. Suitable, contemporary commercial vessels are available second-hand.

67. A dive and hydrographic vessel would deliver the following benefits to Government:

(i) *Capacity and versatility* - As a larger, faster and more capable vessel than the *Manawanui,* the vessel would be able to deploy more rapidly into theatre than current capabilities, carry more equipment, and be able to launch and retrieve larger boats and other gear.

(ii) *Rapidly delivered to Government* - Reducing the capability gap projected from the retirement of *Manawanui* in February 2018 to delivery of a Littoral Operations Support Capability around 2022. A pre-existing vessel could be fitted out for delivery during 2019. With *Manawanui* having played a valuable part in responding to domestic situations such as the Christchurch earthquakes, the reduction in the capability gap would provide value to government.

(iii) *Boosting capability in core tasks* - Enhanced support to diving, hydrography, underwater search and recovery, salvage, and other activities.

(iv) *Domestic and regional response* - Enhanced support to other government agencies around New Zealand and in the South Pacific, including in response to a natural disaster.

(v) *Path to advanced capabilities* - Rebuilding the Navy deep diving and underwater search and recovery capabilities, and positioning the Navy to step up to more advanced capabilities at a later date.

(i) s6(a)

70. Defence is currently undertaking a market survey to provide up to date costs and options for suitable vessels. A paper setting out costed options for a dive and hydrographic vessel would be submitted to Ministers in mid-2018.

Funding changes required

71. The total estimated cost of the Frigate Systems Upgrade, including the negotiated fixed firm price, is $639 million.[9] This is based on a quantitative risk assessment with a 95th percentile contingency and on foreign exchange rates as at November 2017. The current funding for the Frigate Systems Upgrade, including foreign exchange movements, is $491 million. The additional funding required is shown in Table 2.

Table 2: Frigate Systems Upgrade: Proposed additional project funding by year

	$ million				
	2017/18	**2018/19**	**2019/20**	**2020/21**	**Total**
Additional project funding required	10.209	63.358	71.964	2.469	**148.000**

72. The policy and funding recommendations above would require a change to appropriations for both Vote Defence and Vote Defence Force. This change would be cost neutral across the Defence portfolio. No additional capital funding above the indicative costing of the Defence Capital Plan would be required.

73. The impact on capital tagged contingency (set aside for the Littoral Operations and Frigate Communications Upgrade projects) agreed to at Budget 2017 for Defence capabilities is shown in Table 3.

Table 3: Impact of proposed funding change on capital tagged contingency agreed to at Budget 2017

	$ million – increase/(decrease)					
	2016/17	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**Total**
Total capital contingency	2.776	54.892	66.727	101.831	75.425	301.651
Portion of capital contingency allocated to Littoral Operations Support Capability	-	50.283	40.053	85.655	75.425	251.416
Funding to be drawn down from tagged contingency	-	(10.209)	(63.358)	(71.964)	(2.469)	(148.000)
Remaining contingency to Littoral Operations and Frigate Communications projects	2.776	44.683	3.369	29.867	72.956	153.651

74. A decision to increase capital funding for the Frigate Systems Upgrade project by $148 million would not increase the Defence Force's operating costs. There would be no changes in the operating costs of the frigate capability as a result of the changes to the

[9] This figure includes a non-cash expense of $45 million which is a technical adjustment related to foreign exchange. It has no impact on government net debt.

installation process. A reduced scope Littoral Operations Support Capability is expected to cost less to operate than the originally planned-for capability.

Foreign exchange rate volatility

75. The biggest financial risk for the project is foreign exchange rate volatility. The capital and operating funding provisions for Defence have been determined using a set of economic assumptions, including conservative foreign exchange rates. Foreign exchange risk is managed through forward purchase of currency as soon as a contract is finalised and funding is approved. Officials may recommend changes in the level of funding for Defence to offset any significant change in the cost of this investment as a result of foreign exchange rate movement prior to signing the contract.

Timing implications

76. Delays to the project schedule have been incurred to allow negotiation with Lockheed Martin Canada on installation costs to inform this paper.

77. The next space at the s9(2)(ba)(i) in Vancouver for the upgrade is May 2018 for which Defence has received a fixed firm price for installation from Lockheed Martin Canada. To secure this shipyard space and avoid any potential cost increases, Defence would need to sign a contract with Lockheed Martin Canada by 22 December. If Defence can meet this window, the upgrade can be completed approximately 18 months later than previously indicated. If not, the next opening in the shipyard would be in the first half of 2019.

78. If such a delay is incurred, costs are expected to increase by an additional $20 million. The acquired equipment would also need to be warehoused for longer, and warrantees may expire or be significantly run down prior to installation. Defence's experience has been that these equipment and system warrantees have been critical to address quality issues throughout the acquisition period of major projects. Without warrantee, replacement of individual systems could be cost prohibitive.

79. If Cabinet agrees to proceed with the upgrade, it is proposed to accelerate progress s6(a)

80. s6(a)

[10] s6(a)

81. The revised schedule incorporating an overlap in upgrades is in Table 4.

Table 4: Revised schedule for Frigate Systems Upgrade project

Event	Current milestones	Date completed	New baseline[11]
Contract signature	Apr 14	Apr 14	-
Preliminary design review	Nov 15	Nov 15	
Detailed design review	Mar 17	Mar 17	
Training System delivered	Mar 17	Feb 17	-
Ship 1 commences installation	Jul 17	-	May 18
Ship 1 acceptance	Sep 18	-	May 20
Ship 2 commences installation	Jun 18	-	May 19
Ship 2 acceptance	Oct 19	-	May 21

Other implications

82. There are no human rights, legislative, gender, disability, or regulatory implications.

Consultation

83. This paper has been prepared by the Ministry of Defence and the New Zealand Defence Force. The Treasury, s6(a) and Ministry of Foreign Affairs and Trade have been consulted. The Department of The Prime Minister and Cabinet has been informed.

Publicity

84. No publicity is planned. The revised costs will appear in the Ministry of Defence's next Annual Report and on its website.

Recommendations

85. I recommend that the Committee:

Background

1. **note** that the two ANZAC frigates provide the Government with a highly valued maritime capability that can operate across the spectrum of military and national security tasking, and are one of three high end military capabilities the Defence Force maintains, along with maritime patrol aircraft and Special Forces;

2. **note** that at the time of Cabinet approval in 2014 Defence officials underestimated the cost of the Frigate Systems Upgrade project by deriving these costs from an inaccurate third party estimate for the installation phase of the project;

3. **note** that Defence confirmed to Ministers in September 2016 that additional funding would be required to complete the project, and that further analysis during the detailed design phase would be required to provide certainty of the amount of additional funding required and the options available for addressing the issue;

[11] The new baseline includes a schedule contingency.

4. **note** that a series of cost estimates and draft Cabinet papers were provided to the Minister of Defence over the period of September 2016 and August 2017 as costs were further refined by officials in negotiations with Lockheed Martin Canada;

5. **note** that following completion of the detailed design phase in June 2017, Lockheed Martin Canada provided a fixed firm price for installation that was valid until 11 August 2017 for installation to begin in October 2017, and that would have taken the total project cost to $631 million, $140 million above the current appropriation;

s9(2)(g)(i)

7. **note** that the fixed firm price from June has now been revalidated to reflect the delay in a decision on installation, finalisation of design, risk transfer, and foreign exchange, and a subsequently refreshed offer was provided by Lockheed Martin Canada in October 2017 for installation to begin in May 2018;

8. **note** that the current fixed firm price for installation provided by Lockheed Martin Canada remains valid until 22 December 2017, and will, if accepted, increase the total project cost to $639 million, $148 million above the current appropriation;

9. **note** that the Ministry of Defence and New Zealand Defence Force have strengthened their project teams with substantive expertise as part of a significant change process to improve Defence's management of capability projects, and appointed a dedicated project boards to oversee this and other major projects and to provide in depth governance;

Completing the frigate upgrade

10. **note** that Defence has investigated potential options to address this cost overrun and, given the important role of the frigates, the preferred option is to contract Lockheed Martin Canada to complete the project within its current scope;

11. **note** that an independent study confirmed that Lockheed Martin Canada, s9(2)(ba)(i) have the most relevant expertise to install the systems on the frigates and their costs remain competitive in the current market;

12. **note** that Defence's assessment is that the potential savings resulting from approaching market for an open tender would be outweighed by the significant costs, risks and delays associated with a tender process;

13. **agree** that the original scope of the Frigate System Project be retained and the project be completed as planned;

14. **authorise** the Secretary of Defence to contract Lockheed Martin Canada to complete the final phase of the project;

15. **note** that Budget 2017 set aside $301.651 million in a tagged contingency for Defence capabilities signalled in the Defence White Paper 2016. This included $251.416 million for the Littoral Operations Support Capability project;

16. **agree** that the additional funding required to complete the Frigate Systems Upgrade is funded by a reduction in the scope of the Littoral Operations Support

Capability project from a littoral operations support vessel to a dive and hydrographic vessel;

17. **agree** that Defence will report back to Cabinet in mid-2018 with costed options for a dive and hydrographic vessel;

Financial implications

18. **approve** the following capital injection to the New Zealand Defence Force to give effect to the decision in recommendations 6 and 7 above, with a corresponding impact on debt:

	$m – increase/(decrease)				
	2017/18	**2018/19**	**2019/20**	**2020/21**	**2021/22 & outyears**
New Zealand Defence Force Capital Injection	10.209	63.358	71.964	2.469	-

19. **agree** that the capital expenditure incurred under recommendation 11 be a charge against the Defence White Paper 2016 (DWP 2016) – Contingent Capital Funding tagged contingency, established as part of Budget 2017;

20. **note** the following changes to appropriation in accordance with the New Zealand Defence Force – Capital Expenditure PLA authorised by section 24(1) of the Public Finance Act 1989, reflecting the forecast increase in costs to deliver the Frigate Systems Upgrade, with a corresponding impact on debt;

Vote Defence Force Minister of Defence	$m – increase				
	2017/18	**2018/19**	**2019/20**	**2020/21**	**2021/22 & outyears**
Departmental Capital Expenditure: New Zealand Defence Force - Capital Expenditure PLA	10.209	63.358	71.964	2.469	-

21. **approve** the following changes to appropriations to give effect to the decisions in recommendations 6 and 7 above:

	$m – increase/(decrease)				
Vote Defence Minister of Defence	**2017/18**	**2018/19**	**2019/20**	**2020/21**	**2021/22 & outyears**
Non departmental Capital Expenditure Defence Equipment	10.209	63.358	71.964	2.469	-

22. **authorise** the Secretary of Defence to commit and approve additional expenditure of public money up to the amount of $148.000 million for the Frigate Systems Upgrade project;

23. **note** that these costs are offset by a capital receipt from the New Zealand Defence Force, with no impact on net debt;

24. **agree** that the proposed changes to appropriations for 2017/18 be included in the 2017/18 Supplementary Estimates and that, in the interim, the increase be met from Imprest Supply;

25. **agree** that the Minister of Finance and Minister of Defence continue to hold authority to jointly approve expenditure of public money up to the amount of $20.000 million as contingency for the installation stage of the Frigate Systems Upgrade project as authorised in CAB Min (14) 13/14 with the closure of the contingency no later than the acceptance of Ship 2 expected in May 2021;

26. **note** that foreign exchange risks for the cost of the project will be managed through the forward purchase of currency once approval to proceed has been received;

27. **note** that officials may recommend changes in the level of funding for Defence to offset any significant change in the cost of this investment as a result of foreign exchange rate movement prior to the signing of the contract; and

28. **agree** to extend the expiry of the tagged contingency Defence White Paper 2016 (DWP 2016) – Contingent Capital Funding to June 2019 to allow for consideration of options to procure a dive and hydrographic vessel.

Authorised for lodgement

Hon Ron Mark
MINISTER OF DEFENCE

ANNEX A: ANALYSIS OF OPTION D - COMPETITIVE TENDER

Summary

1. While there is scope in the contract with Lockheed Martin Canada to competitively tender the installation phase of the Frigate Systems Upgrade project, Defence's assessment is that any savings that may result from approaching market for an open tender will be outweighed by the significant costs, risks and delays associated with a tender process.

2. Additional costs associated with a tender process include project overheads, legal costs, design rework, freighting equipment to a new shipyard, and potential additional systems integration costs. Risks include losing Lockheed Martin's integration expertise and warranty cover.

3. For these reasons, it is recommended that Defence contract Lockheed Martin Canada to undertake the installation phase of the project. An independent study has found that Lockheed Martin Canada has the most expertise in installing similar upgrades.

Potential to Competitively Tender

4. The current contract with Lockheed Martin Canada only includes support for final system connection and testing once the systems are installed. It does not cover installation of the systems and equipment onto the ships. This provides an option to approach market with a further request for tender for a new Prime Systems Integrator for the installation and integration phase. As with the current proposed arrangement, the Prime Systems Integrator would then subcontract a shipyard to undertake the installation work.[12]

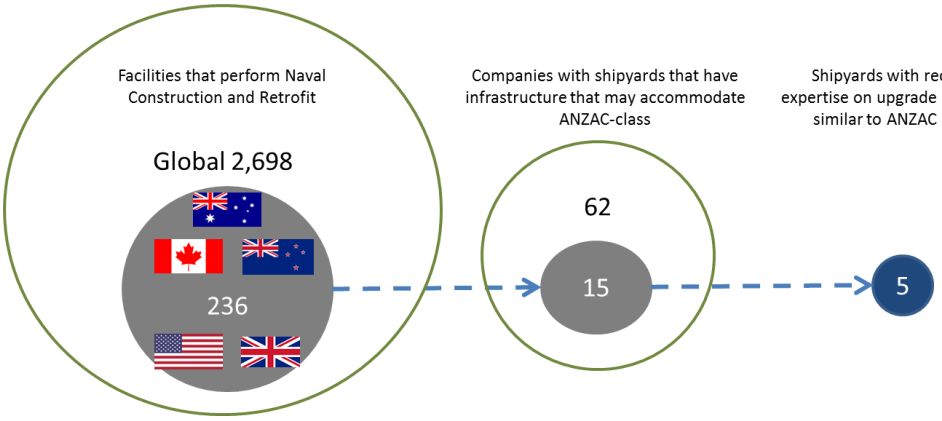
Assessment of Shipyards Able to Undertake the Upgrade

5. To assess the viability of this option, Defence contracted independent company, s9(2)(g)(i), to produce a list of potential shipyards with the capacity to undertake a frigate combat systems upgrade. This included an assessment of similarities of the Frigate Systems Upgrade with close partners, all of whom have recently completed or are completing upgrades to their frigates. Five shipyards were identified as having the requisite expertise to undertake the installation.

6. The study found the Frigate Systems Upgrade shares the most common components with the Canadian Halifax class frigate upgrade. It therefore concludes that the shipyards with the most relevant recent frigate upgrade expertise are s9(2)(ba)(i) which undertook the Halifax class upgrades with Lockheed Martin Canada as Prime Systems Integrator. s9(2)(ba)(i) the most convenient location on the Pacific coast.

[12] While Defence could act in a Prime System Integrator role and contract a shipyard directly to undertake the installation, this would increase the Crown's risk and require the Crown to contract in or employ a number of additional, specialist personnel. It is not recommended based on experience of undertaking this role in other projects.

Figure 1: Shipyards with recent expertise suitable for the Frigate Systems Upgrade



7. Babcock New Zealand is currently contracted to provide maintenance, repair and overhaul support for Navy, and completed the Platform Systems Upgrade and other minor engineering changes on the frigates. s9(2)(b)(ii)

Timing Implications

8. A tender process would take a minimum of 12 months. In addition, the installation phase would be extended by a minimum of 3 months due to a need to amend current Lockheed Martin Canada designs to suit the methods, procedures and processes of a new installer. As the Frigate Systems Upgrade project will install a number of International Traffic In Arms Regulations controlled systems, United States Department of State pre approval would be required prior to substantial component of the platform integration design being released to potential tenderers. This process typically takes in excess of six months. This would result in a total delay of between 15 and 18 months.

9. This additional delay would directly impact benefits realisation. From a Defence Force perspective, risks of delay lie around New Zealand's ability to meet international commitments and credible contributions to global maritime security operations. s6(a)

Cost Implications

Labour costs

10. Labour is a driver of costs in the installation phase, equating to around a third of the overall cost. The overall labour cost is a combination of the hourly rate and the efficiency of the workforce.

11. s6(a)

12. s6(a)

Tender process costs

13. The potential costs associated with a competitive tender process are detailed in Table 1 below.

Table 1: Potential costs associated with a competitive tender process

Category	Impact	Cost (NZD million)
Delay	A tender process is estimated to delay the project schedule by a minimum of 12 months. This will lead to an increase in costs to maintain the project for a longer period. Specific costs include warehousing, project team and governance costs, and foreign exchange risk.	s9(2)(b)(ii)
End to End Systems Integration	The current arrangement with Lockheed Martin Canada includes synergies and risk premiums based on Lockheed Martin directly managing all subcontractors. s9(2)(b)(ii)	
Fleet maintenance services	s6(a)	
Systems Integration Effectiveness	If ship installation services are placed with another provider, there is a risk that the overall effectiveness of the project, including the cost and schedule, could be negatively impacted, including delays to shipping and staging of classified equipment provided by Lockheed Martin Canada as well as government furnished equipment providers, and that additional transport and installation costs will be incurred. Whilst difficult to estimate accurately these could be in the range s9(2)(b)(ii)	
Total potential additional cost		

s9(2)(g)(i)

s9(2)(g)(i)

s6(a)

ANNEX B: ANZAC FRIGATE HISTORY

1. In the mid-1980s, Defence began considering replacement of the *Leander*-class frigates. Australia was going through a similar process and it was decided to collaborate on the acquisition. A Memorandum of Understanding was signed in early 1987.

2. The Government signed a contract for the purchase of two ANZAC class frigates in November 1989. Australia contracted for eight ships. The New Zealand contract included an option to purchase two further frigates.

3. The frigates were based on a MEKO 200 design, modified to meet Australian and New Zealand specifications and to maximise the use of locally built equipment.

4. The ships were built in Australia. New Zealand was allocated the second and fourth slots in the build schedule. Construction of *Te Kaha* started in 1994 with the frigate commissioned in July 1997. Construction of *Te Mana* started in 1996 with the frigate commissioned in December 1999.

5. The option for two further frigates lapsed in November 1997. In 2002, the Government decided to replace the remaining Leander frigate with a multi-role vessel (HMNZS Canterbury).

6. Both Australia and New Zealand intended to upgrade the ANZAC frigates mid-life. In the end, the countries followed different upgrade paths. Australia completed an anti-ship missile defence upgrade between 2011 and 2017 at a publicly stated cost of AUD 650 million.

7. The first two New Zealand upgrade projects were announced by the Government in 2006 and have subsequently been completed:

7.1. Phalanx Close in Weapon System (CIWS) – the CIWS system protects the ship against short-range weapons and small attack craft. The CIWS was moved from the *Leander*-class frigates to the ANZAC frigates when they entered service. An upgrade was approved in 2007 at a cost of $22.7 million.

7.2. Platform Systems Upgrade – a refit of the frigates' hull, propulsion, heating, ventilation, air-conditioning and integrated platform systems. Cabinet granted approval to initiate the project in 2006 and to release a tender in 2007. Joint Ministers were delegated authority to release up to $57.6 million for the project. Following schedule and budgetary problems, additional funding was approved by Cabinet in 2014, bringing the total cost to $86.1 million.

8. There was also an upgrade of the maritime helicopters which are deployed on the frigates, to enhance their combat and surveillance roles, transport stores and personnel, undertake search and rescue and medical evacuations, and assist in boarding operations. In 2011, Cabinet approved undertaking due diligence to replace the current five Super Seasprite helicopters with a new version, initially built for Australia. Cabinet approved contract negotiation in 2012, and contract signature in 2013 at a cost of $242 million for eight helicopters, two spares, a simulator, and missiles.

9. One further project will be presented to Cabinet in 2018, to upgrade the communications systems on the frigates. The Defence Capital Plan has $50.23 million allocated for this project.

Frigate Systems Upgrade
HMNZS Te Kaha and Te Mana

New Zealand MINISTRY OF DEFENCE
Manatū Kaupapa Waonga

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

The Frigate System Upgrade is a project to maintain the surveillance, combat, and self defence capabilities of the frigates. These are the systems that enable the frigates to be viable in combat and to operate and protect other ships in areas with threats s6(a) .

The upgrade is being delivered in three overlapping phases– **installation design, purchase of equipment and systems,** and **installation**

Phase 1

Installation design was completed successfully by the prime systems integrator, Lockheed Martin Canada.

Phase 2

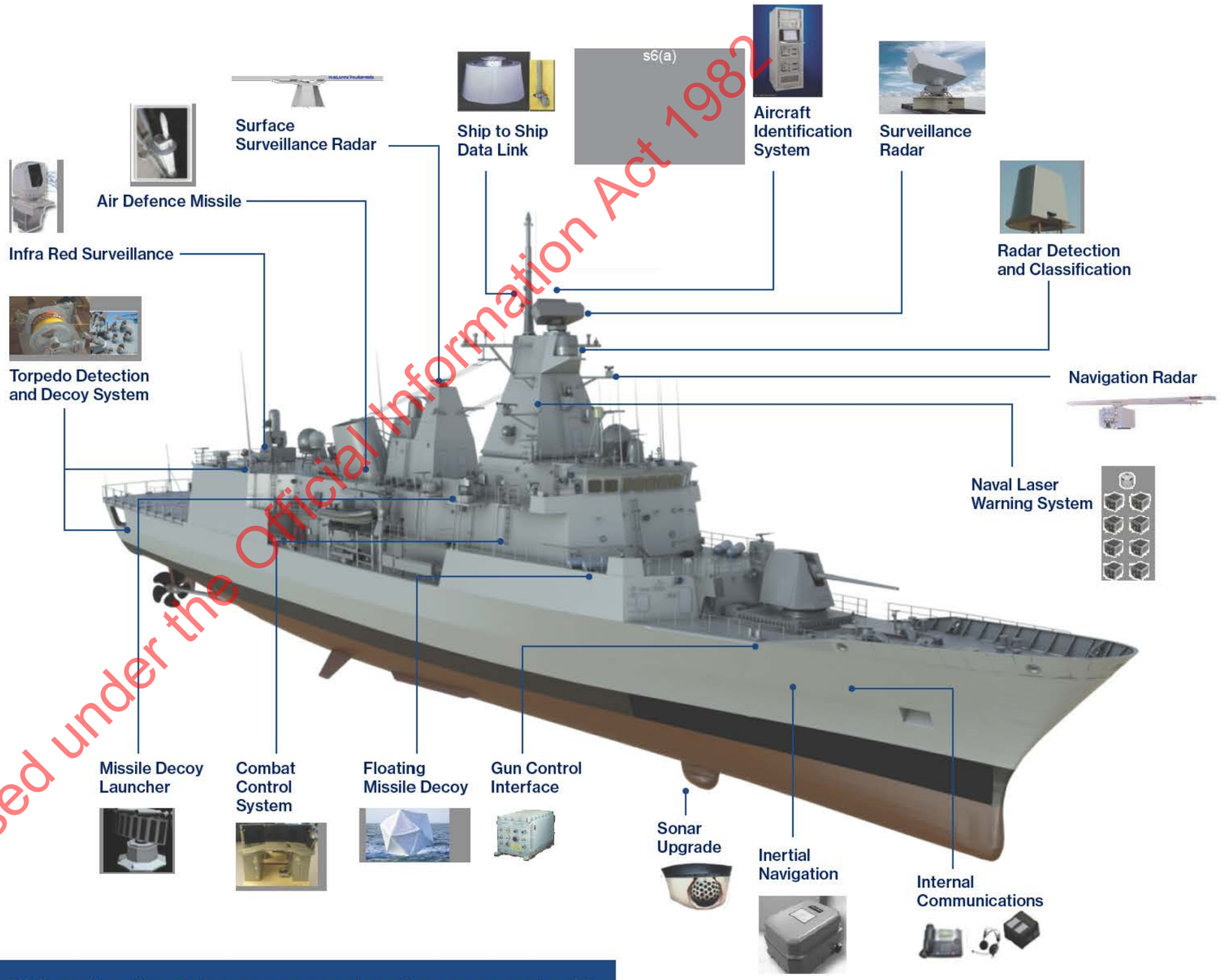
Purchase of equipment and systems is also complete. The equipment pictured has all been procured and is either held by vendors or delivered to the Seaspan shipyard in Canada.

- Phases 1 and 2 were completed within the estimated budget, with a total of $369 million spent or committed to date.

Phase 3

Installation requires an additional $148 million to complete, due to an underestimate of these costs by the Ministry of Defence.

- This can be funded from within the capital funding already set aside for the Defence Portfolio at Budget 2017.
- If Cabinet agrees to proceed with the Frigate Systems Upgrade installation will begin on the first frigate in May 2018.
- Frigate one would finish the upgrade and be ready for tasking from May 2020.
- Frigate two would finish the upgrade by May 2021 (18 months after initially planned).



What is being upgraded?

- The upgrade includes a new combat management system, new radars, s6(a) and other above water systems, the self-defence missile system, decoys against missiles and torpedoes, and an upgrade to the hull-mounted sonar.

Why do the frigates need to be upgraded?

- Most of the combat system equipment on the frigates is now 20 years old, and is difficult to maintain and ineffective against current and emerging threats. Maintenance costs have increased significantly and some systems are no longer able to be supported in an operable state. The upgrade will replace these systems to allow the frigates to continue to operate safely in medium and high threat environments.
- Similar upgrades have been undertaken by the Navies of Australia, Canada and the United Kingdom on ships of a similar age and design to address this obsolescence and evolving threat.

New Zealand's Naval Combat Capability
HMNZS Te Kaha and Te Mana

New Zealand MINISTRY OF DEFENCE
Manatū Kaupapa Waonga

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

The two Anzac class frigates HMNZS Te Kaha and Te Mana are the main fighting ships of the Navy and play a vital role in protecting New Zealand, its exports, maritime resources and those of our partners.

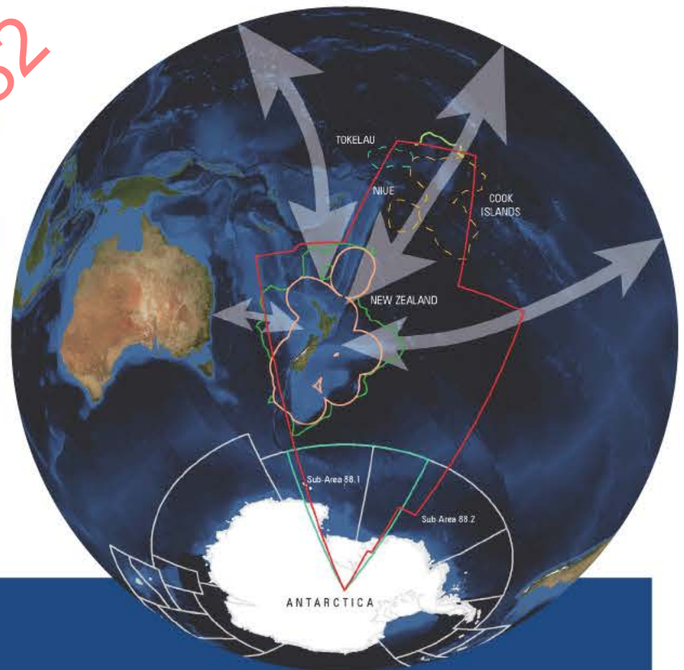
The frigates have supported peacekeeping operations in Bougainville, Timor-Leste and Solomon Islands by defending sea access to the islands and acting as a deterrent to hostile acts and may be required to in the future.

They have contributed to counter-terrorism, piracy and narcotics operations in the Middle-East and off the Horn of Africa by conducting surveillance, patrol, and maritime interdiction in potentially hostile environments...

... and contributed to the international rule of law by conducting high end military exercises with New Zealand's defence partners.

The ability to deploy a credible maritime combat force in New Zealand's region and beyond is highly valued by Australia and has contributed to New Zealand's strengthened relationship with the United States.

Te Kaha led the tactical command of a multinational maritime response to the Kaikoura earthquake.



Advancing New Zealand's Interests from the Sea

During a six month deployment in 2017, HMNZS Te Kaha showed the wide utility of the frigates. The ship and its company conducted a range of activities including:

- exercises with Australia, focused on air defence and anti-submarine warfare;
- acting as the commander of an international maritime task group during a Five Power Defence Arrangement exercise with Singapore, Malaysia, Australia and the United Kingdom;
- participating in an international fleet review and defence diplomacy activities as part of celebrations of the Singaporean Navy's 50th Anniversary;
- participating in an exercise with the United States, Canada, and Japan including anti-submarine warfare and surface gunnery;
- demonstrating New Zealand's support for the principle of freedom of navigation, s6(a) ;
- supporting New Zealand's relationship with the United States by providing, at short notice, security to the USS Nimitz Carrier Strike Group;
- conducting defence diplomacy, in support of the Ministry of Foreign Affairs and Trade, through port visits throughout Asia; and
- transiting and exercising with the New Zealand Navy's tanker HMNZS Endeavour.

This deployment demonstrates the value of the frigates to New Zealand's defence relationships and wider foreign policy objectives, including supporting the international rule of law.

Legend

- Import and Export trade to Australia, Asia, Europe and Americas
- New Zealand Search and Rescue Region
- New Zealand Extended Continental Shelf
- Cook Islands Extended Continental Shelf
- Ross Dependancy including CCAMLR* Sub-Areas 88.1 and 88.2

Exclusive Economic Zone (EEZ)

- New Zealand
- Niue and Cook Islands**
- Tokelau***

* Convention for the Conservation of Antarctic Marine Living Resources
** Free Association with New Zealand
*** New Zealand Dependancy

Anzac Frigate timeline

1987 — A Memorandum of Understanding is signed between New Zealand and Australia to cooperate on the Anzac Frigate programme

1989 — The government signs the contract for the purchase of two Anzac Class Frigates

1994 — Construction begins on HMNZS Te Kaha

1996 — Construction begins on HMNZS Te Mana

1997 — HMNZS Te Kaha enters service

1999 — HMNZS Te Mana enters service

2006 — The government announces two projects: the upgrade of the Phalanx Close-In Weapons System; and the Platform Systems Upgrade which will maintain the systems that allow the frigates to move, float, generate power, and recover from damage.

2007 — Cabinet approves the upgrade of the Phalanx Close-In Weapons System at a cost of $22.3 million

Cabinet approves the Platform Systems Upgrade, at a cost of $57.6 million

2008 — Cabinet is advised of the need to upgrade the frigates surveillance and combat systems, and directs a detailed business case be prepared

2012 — Cabinet authorises the Secretary of Defence to issue a request for tender for the Frigate Systems Upgrade project, with an estimated cost of $354–375 million

2013 — Cabinet approves the purchase of eight SH-2G(I) Seasprite Helicopters, two spares, a simulator, and missiles at a cost of $242.2 million, providing enhanced surveillance, warfare and airlift for the Navy

2014 — Following schedule and budgetary problems in the Platform Systems Upgrade project additional funding is approved by Cabinet, bringing the total cost to $86.1 million

Cabinet agrees to proceed with the Frigate Systems Upgrade project at an estimated cost of $446 million

2018 — (Scheduled) Cabinet will be presented with a Single Stage Business Case detailing options to upgrade the frigates' communications systems

Littoral Operations Support Capability Project
Options Overview

New Zealand MINISTRY OF DEFENCE Manatū Kaupapa Waonga

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

The description of the Dive and Hydrographic Ship is indicative only, and will depend on the market for suitable second hand vessels at the time and any further changes to the project budget.

	HMNZS *Manawanui* *Current capability*	Dive and Hydrographic Ship *Trade-off to meet Defence Capital Plan pressures*	Littoral Operations Ship *Meets current policy requirements as set out in Defence White Paper 2016*
			
Survivability & Self Protection	Restricted to operations in benign environments. .50 calibre machine guns providing protection from small craft out to 0.5 nautical mile.		Able to operate independently in a **medium threat** environment. Remotely operated and stabilised 25mm and .50 calibre guns, providing protection from small craft out to 4 nautical miles. **Survivability** and redundancy features.
Command, Control and Communications	Basic military communications suite sufficient for operations in the South Pacific, and to contribute to a basic humanitarian assistance and disaster relief (HADR) response. Civilian compliant surveillance (i.e. navigation radars).		s6(a) **Mission processing and joint planning** room with the capability to coordinate a complex HADR response, or stability and support operations. Other government agencies planning space.
Platform-based Hydrography	None.	Multi and single beam echo sounders for mapping the sea floor. Rapid survey of approaches to ports and beaches to allow the landing of forces.	Multi and single beam echo sounders for mapping the sea floor. Rapid survey of approaches to ports and beaches to allow the landing of forces. Storage and maintenance space for **Autonomous Underwater Systems.**
Embarked Force (additional to crew)	**6 personnel.** Launch and recovery of small boats in a calm sea state. Two bed basic medical facility.	**25 personnel.** Launch and recovery of s6(a) Two bed basic medical facility.	**50 additional bunks** and a working dog facility. Tactical launch and recovery of **large specialist boats** via slipway in **high sea states**. **Storage** rooms, **preparation** areas, **briefing** room and **armoury** for embarked forces. **Four** bed medical treatment facility including **resuscitation.**
Aviation	Resupply and casualty evacuation via helicopter winch onto working deck, restricted by small working deck area.	Resupply and casualty evacuation via helicopter winch onto working deck. Potentially a helicopter deck (no hangar or refuelling).	Helicopter deck and **refuelling capability** for a NH90 (no hangar). Space to launch, recover, and store a **Remotely Piloted Aerial System**.
Diving & Underwater Salvage	Air diving system over the side. Recompression chamber. Remotely Operated Vehicle (300m depth). Salvage crane (13t lift).	Air diving system through moonpool. Recompression chamber. Remotely Operated Vehicle (300–1,000m depth). Salvage crane (50t lift, including lifting personnel).	Air diving system through moonpool. Recompression chamber. Remotely Operated Vehicle (1,000m depth). Salvage crane (50t lift, including lifting personnel).
Size & Speed	43 metres length, 911 net tonnes. Max speed 10.5 knots. Economic speed 10.5 knots.	80–100 metres length, 1,500–4,000 net tonnes. Max speed up to 16 knots. Economic speed up to 14 knots.	110 + metres length, 4,000 net tonnes. Max speed 16 knots. Economic speed 14 knots.
Capital Cost		s9(2)(g)(i)	s9(2)(g)(i)

*Costs are provided as at 14 November 2017, and are subject to changes in exchange rates.