

REPORT OF THE REVIEW OF THE SAFETY AND FUNCTIONALITY OF HMNZS CANTERBURY

Summary and Recommendations

Background

1) Project Protector is the \$500 million NZ project, managed by the Ministry of Defence, to acquire seven new ships for operation by the Royal New Zealand Navy. This fleet of ships will meet gaps in New Zealand's military and civil surveillance and sealift capabilities.

2) The context for this review is set out in the terms of reference which are appended to this report at annex A. In brief:

- a) The requirements for the Protector fleet were identified in the 2000 Sealift Review and the 2002 Maritime Forces Review.
- b) The Ministry of Defence issued and considered industry responses to an invitation to register in 2002. It then called for and evaluated detailed requests for proposals through 2003 and early 2004.
- c) A proposal from Tenix Defence Systems Pty Limited was accepted in May 2004 and a fixed price contract was signed in July of the same year.
- d) The contract called for the delivery of one multi role vessel (the MRV, now HMNZS CANTERBURY) for tactical sealift and patrol, two offshore patrol vessels and four inshore patrol vessels.
- e) Tenix (now BAE Systems Australia) subcontracted the MRV construction to Merwede B.V. in the Netherlands. A Merwede subcontractor built the ship's landing craft. Finishing work was undertaken by Tenix at its dockyard in Melbourne.
- f) HMNZS CANTERBURY was accepted by the Ministry of Defence from Tenix on 31 May 2007 and commissioned into the RNZN on the same day.
- g) After taking delivery of the HMNZS CANTERBURY two significant incidents involving the vessel resulted in Courts of Inquiry being established.
- h) The first involved the loss of a rigid hull inflatable boat (RHIB) at sea on 10 July 2007, and the second the death of a crew member on 5 October 2007 during a manoeuvre at sea to deploy a RHIB.
- i) On 20 December 2007, the Minister of Defence, the Hon Phil Goff, announced that the Secretary of Defence and the Chief of Defence Force were commissioning an independent review, on his instructions, into the ship's acquisition and introduction into service.

The Review

3) The purpose of the review is to identify any concerns relevant to the operation of HMNZS CANTERBURY or its design or performance, report whether it is capable of performing the functions for which it was acquired, and identify any remedial action that may be needed. The review may also provide lessons for future acquisition projects, or the introduction into service of equipment.

4) Following initial preparations, the review started on 12 May 2008. It has been conducted by John Coles (Team Leader, formally Chief Executive of the UK MoD's Warship Support Agency), John Clayton (formally Director of the UK MoD's Project Rehabilitation Unit), and with assistance, during the initial phases of the review, from Captain Graham Baxter, Royal Navy (Admiralty Trials Master).

5) The review has been undertaken in four phases:

- a) Planning and document review in the UK
- b) Interviews in New Zealand and Australia with staff of the MoD, NZDF, and Tenix Defence Systems Pty Limited (prime contractor, now BAE Systems Australia), including time spent on board the ship.
- c) Identification of issues, development of hypotheses, interviews with Merwede and Lloyd's Register (sub-contractors).
- d) Clarification interviews, report drafting and submission.

6) The methodology has been to gather facts, identify key issues and to develop hypotheses. All interviews were conducted on a non attributable basis to encourage open comment. A list of those interviewed is at Annex B and a summary of key events at Annex C. Part 1 of the report addresses the conduct of HMNZS CANTERBURY's acquisition, including the introduction into service, Part 2 addresses the safety and functionality of the ship today and Part 3 suggests a way ahead.

Findings

7) HMNZS CANTERBURY will meet almost all of the requirements of the NZDF's Functional Performance Specification (FPS), and is intrinsically safe.

8) HMNZS CANTERBURY's acquisition has been constrained, however, by the initial choice of ship design; it has been managed to get the ship into service as soon as possible, and it has been characterised by shortcomings in project management and governance and collective wishful thinking. It is unlikely to meet all of the requirements of the contract.

9) Our key observations are as follows:

- a) HMNZS CANTERBURY is intrinsically safe but remedial work will be required to enable her to perform military functions; some operating limitations will also have to be accepted. Sea keeping performance is likely to be poor in higher sea states.

- b) From the outset of the project, there was insufficient appreciation of the constraints to the ship's operations imposed by the selection of a commercial Roll-on, Roll-off (Ro-Ro) design. This has been at the root of differences of opinion between Tenix, the MoD and NZDF and the shortfalls in performance being faced today.
- c) The programme has been managed with relentless determination to deliver to time despite evidence of likely performance shortfalls. There was, however, no explicit consideration of the risks of doing so.
- d) The complexity and challenges of the programme have been under-estimated in all respects. The project team has lacked the size and range of skills to manage a project of the complexity of HMNZS CANTERBURY.
- e) There have been significant shortcomings in the governance of the HMNZS CANTERBURY acquisition, exacerbated by some strained relationships between the MoD and NZDF. Reporting of project performance has been generally inadequate.
- f) Roles and responsibilities need to be clarified in a number of areas, notably for safety during the acquisition phase and design responsibility throughout a project's life; improvements could also be made to the ship trials and acceptance process.

Recommendations (general)

- 10) For future acquisition programmes, the risks of acceptance should be clearly identified and, as far as possible, quantified before the decision on acceptance is taken. Legal advice should be taken so that commercial risks can be taken into account.
- 11) Acquisition programmes should be reviewed to ensure that they are adequately staffed both in terms of size and specialist skills.
- 12) Commercial experts should be consulted on key correspondence with contractors and attend all key meetings with them.
- 13) Deputy Secretary (Acquisition) (Dep Sec(A) should (a) hold quarterly reviews with his Project Directors and (b) provide written reports on project progress, issues, risks and their mitigation to the Integrated Capability Management Committee (ICMC).
- 14) The ICMC should be tasked formally to review the progress of projects in the acquisition phase, noting that Dep Sec (A) remains responsible to Sec Def.
- 15) CDF and Sec Def should issue a joint instruction to their staffs stressing the need to regard acquisition and in-service support as a continuum on which they should work together, and emphasising the importance of stakeholder management.
- 16) The Naval Authority should be independent of the Chief of the Navy.
- 17) The Executive Capability Board (ECB) should include one or more non-executive directors, drawn from outside the MoD/NZDF, to provide independent expertise and challenge in the conduct of acquisition programmes.

18) For ship acquisition, consideration should be given to planning for an additional period of ship's trials with the purpose of system proving before the formal acceptance off contract.

19) An explicit responsibility for procuring safe equipment should be included in Acquisition Staffs' terms of reference.

20) The Design Authority role should be defined in future acquisition programmes.

Recommendations (specific to HMNZS CANTERBURY)

21) Consideration should be given to entering into one or more arrangements for design support of the Protector Fleet to maintain the long-term sustainability of the supplier base.

22) To enhance the safe operation of the MRV:

- a) The ship designer should be requested to provide additional guidance to the RNZN on machinery configuration and preferred headings/speed in high sea states, both to minimise ship motions and to reduce the risk of the loss of propulsion when such conditions are encountered.
- b) The sea boats should be relocated or, if relocation is not practical, they should be provided with protection.

23) To improve the functionality of the vessel:

- a) Advice from Lloyd's Register should be sought to secure Global Seas Operation for the desired operating profile.
- b) Additional ballast should be added to the ship to reduce vertical accelerations.
- c) Arrangements for ballasting the ship should be incorporated to maintain its design draught when lightly loaded.

24) Assistant Chief Development (AC Dev) should be assigned formal responsibility for completing the work commenced on compliance of the Functional Performance Specification with the delivered ship.

25) Work streams should be set up to implement the project management/governance recommendations in this report, implement a HMNZS CANTERBURY Get Well Programme, and develop a strategy for moving forward with Tenix.

Part 1 – The Acquisition of HMNZS CANTERBURY

The constraints of selecting a Commercial Ro-Ro design as the basis for MRV

- 1) From the outset of the project, there was insufficient appreciation of the constraints to the ship's operations imposed by the selection of a commercial Ro-Ro design as the basis of the design for the MRV. This has been at the root of differences of opinion between the Tenix, MoD and NZDF and the subsequent shortfalls in performance.
 - a) The Tenix proposal for the MRV is based on the Ro-Ro Ferry *Ben my Chree*. Tenix placed a sub-contract for design and manufacture of the MRV with Merwede B.V. in the Netherlands who also manufactured the *Ben my Chree*.
 - b) The *Ben my Chree* is a 'short/fat' ship that operates across the Irish Sea where conditions are akin to coastal waters, where the seas are generally short crested as compared with deep oceans. Even a cursory examination of her design and operating profile should have raised questions over her suitability, once modified, for long operational patrols in the Southern Oceans. It is axiomatic that the hull form of a ship designed for short sea crossings may not be ideally suited as a solution to fulfil the full Functional Performance Specification¹ for the MRV.
 - c) While the MoD's technical evaluation of the Tenix proposal for the MRV identified a number of concerns associated with the design, it did not recognise that the behaviour of the ship in a seaway was already predetermined. The technical evaluation team judged the Tenix proposal to be "medium risk" and thus we find it surprising that the team did not visit the *Ben my Chree* and improve its understanding of the design being offered.
 - d) Following the evaluation but pre-contract, the Project Team sought to clarify aspects of the Tenix design and, as part of this process, commissioned a high level assessment of the Tenix MRV proposal (undertaken by BMT Defence Services Ltd (BMT); dated April 2004.) This assessment identified high level risks for which BMT recommended that the MoD request further information. These high-level risks encompassed sea keeping, stability, aviation operations and aircraft handling, powering and electrical generation, structural integrity and aspects of design that impact on sea keeping issues and operational effectiveness. Many of these have subsequently come to be issues of substance.
 - e) The treatment of the BMT report by the Project Team was somewhat selective since some of the key issues were not put to Tenix and, therefore, not investigated. Tenix's responses to the issues put to them, led to the recommendation that Tenix should be confirmed as the preferred bidder for the MRV.

¹ The Functional Performance Specification is essentially the military requirement that the contract seeks to deliver.

- f) Concern about sea keeping dominated the acquisition of the MRV after contract award. In February 2005, a matter of months after the contract had been placed, serious concerns about the dynamic behaviour of the MRV in high sea states began to emerge. The contract between Tenix and the MoD was suspended on 24 March 05 and then lifted on 17 May 05 following acceptance by the MoD of Tenix's remedial plans – including that for additional data on sea keeping, in particular revised computer simulation of the MRV's performance (known as the AMOG results). Preliminary information from AMOG was available in June although the formal submission was in October 05. Subsequently an agreement was made between the MoD, Tenix and Merwede to collect more evidence by undertaking tank testing using a scaled model.
- g) The tank testing, undertaken by the Maritime Research Institute Netherlands (MARIN), took place in November 05. The results were published in February 06. The MARIN tests did not produce a materially different result to the AMOG simulations although they did highlight the risk of water ingress into the alcoves and the potential risk of sea boat damage. There then followed a protracted round of correspondence between the Project Director, Tenix, a consultant Naval Architect and equipment suppliers to understand the ramifications of the tank test results and to consider what should then be done. With delivery and acceptance planned for 31 May 07, the Project Director wrote to the Navy, as the future operating authority, in April 07 to “close out” the MARIN issues. We are surprised that the Naval Staff were not more closely associated with the discussions on the results of the MARIN tests given the complexity of the issues and the expertise that they could have provided.

2) Under the terms of the contract Tenix agreed to deliver a sea keeping performance for the MRV, and its ship to shore transfer system, considerably in excess of that specified in the FPS. The company, in its response to the RFP, submitted an analysis of sea keeping performance based upon frequency domain strip theory. While such analysis is reasonably accurate in predicting sea keeping performance up to sea state 6, it may not be relied on as an indicator of performance at higher sea states. The ability of the contractor to deliver such enhanced performance levels, could only have been challenged by the project team had it been equipped or had access to a high level of domain knowledge. In the event, the scale of the limitations of the Tenix design in relation to the contract, while recognised by the RNZN at the time of contract suspension, only became clear with the completion of a more sophisticated analysis using time domain strip theory – undertaken by AMOG - and confirmed by the MARIN tank tests.

3) The MARIN tests may have deepened understanding of how the MRV would perform in higher sea states but they could do nothing to change that performance. The performance of the ship was pre-determined by the design offered by Tenix and the ship was effectively completed while the MARIN issues were being extensively debated. We doubt whether the MARIN tests were really necessary since they merely confirmed the AMOG results. Had action been taken to address sea keeping at the time of the AMOG simulations, greater progress would have been made in addressing performance issues that currently confront HMNZS CANTERBURY.

4) We conclude that insufficient technical understanding was brought to bear from the outset of the programme. That this was not recognised suggests that there was insufficient technical expertise in the project team to fully comprehend some key design issues and, therefore, the ability to articulate concerns and seek guidance. Furthermore, there was an absence outside the project of technical governance on key issues such as sea keeping, or, as identified later, the challenges of safety in the context of meeting SOLAS² and other statutory requirements, and the limitations of Lloyd's Register's certification on a commercial Ro-Ro design incorporating significant military features.

² SOLAS = Safety of Life At Sea

A Programme managed to achieve the earliest delivery, characterised by wishful thinking

- 5) All programmes should be managed to achieve their performance, cost and time objectives. While we understand the desire, emanating from very senior levels, to reduce the time from the frigate Canterbury paying off and to the delivery of the MRV, we have found a relentless determination to deliver to time, across both the MoD and NZDF, despite evidence of likely performance shortfalls e.g.
- a) At the outset of Project Protector, the stated intention was to employ a sequential approach to design, before freezing the design that would be produced. This is not what happened - production got ahead of design from an early stage. Steel was cut in mid-April 05 - probably because of production pressures in Merwede - during the period of contract suspension. The decision to lift the contract suspension in May 05, despite unresolved issues on the MRV's sea keeping characteristics, was critical in enabling production to continue. With hindsight, contract suspension should have been the time to extract firm performance guarantees from Tenix or to negotiate relaxations.
 - b) The MARIN Tank tests were undertaken in November 05 and the report issued in February 06. The protracted resolution of the issues arising from the MARIN test results, lasting some 15 months were completed only a matter of a few weeks before the acceptance of the ship. This meant that little or nothing could be done to address these issues during manufacture. The MoD's agreement to conduct the MARIN tests effectively let Tenix off the hook of addressing sea keeping performance before ship construction was too far advanced
 - c) The ship set sail from Rotterdam in August 06 before planned acceptance had taken place of all essential seagoing functions and the material configuration, functionality and condition of the ship.
 - d) Incidents, noted in the Canterbury Engineering Master Log, during the journey from the Netherlands to Australia were warning signs of sea keeping difficulties to come e.g. bow slamming (12 Sept 06) and the swamping of the starboard RHIB with green water and the opening of the starboard alcove door (22 Sept 06).

The Ship Acceptance Process

- e) The conduct of the acceptance of the ship off contract illustrates vividly the drive to deliver HMNZS CANTERBURY and get her into service at the earliest opportunity. There was, however, no explicit consideration of the risks of acceptance with defects, as opposed to tolerating delay to rectify defects before delivery. The discussion of acceptance at the Capability Development Executive (CDE) was initially not recorded in minutes; there was no discussion at the Integrated Capability Management Committee (ICMC), and there was little recorded discussion at the Executive Capability Board (ECB).³
- f) At the time of acceptance there were a number of deficiencies outstanding of varying importance. Advice from project staff to the Project Manager and

³ The respective roles of these bodies is described in paragraph 19.

Director made clear that the technical issues outstanding would present a significant challenge to the RNZN if the MRV were to be accepted on 31 May 2007 as planned. The incompleteness of the verification and acceptance (V&A) process immediately before planned acceptance was specifically highlighted. Indeed, only a very small percentage of the deliverables required by the V&A plan had been formally agreed by the project team at acceptance.

- g) The Project Director, in his advice to Sec Def, recommended acceptance citing the need to have the ship available for ship's personnel and expressing the concern that delay could lead to demoralisation and people leaving the service. He went on, however, to acknowledge that while individual defects are minor in sum their culmination of defects could be considered major. He also commented that knowing what he did at the time of writing he would have delayed acceptance by 8 weeks. These apparent drawbacks of acceptance were not developed further; we are not aware that they were subsequently questioned.
 - h) Initially, Naval Staff advice drew attention to the considerable deficiencies in the contractual deliverables provided by Tenix, the need for a rectification plan, weighed in the balance the risks of acceptance, and concluded in favour of acceptance. This advice was withdrawn and substituted by a shorter document that played down or removed reference to the drawbacks of acceptance, thus placing relatively greater emphasis on the adverse impacts to the Navy if acceptance were to be delayed. The imperative reported by the Chief of the Navy to CDF and Sec Def was of the need to get HMNZS CANTERBURY into service.
 - i) Having decided to proceed with acceptance, more should have been done to protect the Crown's position.
 - j) The underpinning document is the Report on Material State at Completion (RMSC). This document lists areas to be rectified by the contractor and also includes over 40 MoD Outstanding Actions and Issues of Concern. We do not feel that expressing "concerns" in the RMSC will have been sufficient to protect the interests of the Crown.
 - k) Furthermore, in view of the potential for debate about the RMSC and the status of the concerns listed therein, we would have expected commercial/legal advice to have been taken on the form of acceptance and legal risks of accepting the vessel on the date envisaged.
- 6) We conclude that, on a number of occasions, the MoD could have taken a more robust line with Tenix to enforce the contract. We suspect that this was not done because of a lack of understanding of the technical issues, caused in part by under-staffing in the project team and poor governance outside it. The approach taken by those involved in key decisions was, it seems to us, "to crack on come what may" and to hope perhaps that something might turn up. We note that many of the problems identified at an early stage of the programme manifested themselves after acceptance and are now the subject of an extensive Warranty claim that has been submitted to Tenix.

Recommendation:

- For future acquisition programmes, the risks of acceptance should be clearly identified and, as far as possible, quantified before the decision on acceptance is taken. Legal advice should be taken so that commercial risks can be taken into account.

An under-estimated Project Management task; a team under-sized and under-skilled

- 7) Project Protector is not a simple acquisition project. While not at the cutting edge of technology, it involves the procurement of three vessel types, modification of commercial designs (which need to be understood), commercial and military certification and a contractor and sub-contractors across the globe. The complexity and challenges of the programme have been under-estimated in all respects.
- 8) The approach to setting the contingency at the outset of the programme and to certification are symptomatic of the under-estimation of the project management task.
- a) Setting the contingency - All programmes require a contingency which should be established after an analysis of risk. The sum eventually assigned as contingency may not be as much as analysis suggests but decisions by senior management should be taken in the light of an objective assessment. It is symptomatic of project management for Protector that such an analysis did not take place - the programme contingency was simply the difference between the estimated programme costs and the sum that the Cabinet authorised (\$500M NZ).
 - b) Certification, or more accurately Lloyd's Register Rules and Regulations for the Classification of Ships, and other statutory rules were assumed to be straightforward. It would be a task for Lloyd's Register but the process for seeking waivers, in particular for the impact of military features, was not thought through at the time of contract signature. The granting of waivers by the Maritime Safety Authority (now New Zealand Maritime) did not get off the ground and a Naval Authority had to be quickly established to act as the Flag State Authority. The certification process led to dysfunctional behaviour and friction between parts of the Navy and the Acquisition branch. The Naval Authority, which was line managed by the Navy, should have been regarded as an independent safety authority. Its role, however, was difficult to separate from the Navy's role in providing advice to the project team - the Naval Authority was regarded by the MoD as a risk to the programme.
- 9) A fundamental deficiency, and possibly the underlying cause of some of the problems cited above, has been the staffing of the project team. The project team has lacked the size and range of skills to manage a project of the complexity of HMNZS CANTERBURY.

10) Our expectations for a project team are as follows:

What good looks like:

An empowered Project leader

A culture of debate and discussion in the team

Embedded technical, financial and commercial/legal skills

Risk Management and risk mitigation

Staff in sufficient numbers to manage the programme

11) We found the project team to be lacking in a number of these areas.

- a) Staff have been over-stretched at all levels over a long period of time. The team comprises a Project Director, with other responsibilities, based in Wellington, and a Project Manager and five seconded naval staff in Melbourne. At the critical time of acceptance, the Project team was way behind on Verification and Acceptance because of shortage of manpower. Anecdotally, there have been areas of acute stress in the project team.
- b) The team has lacked the range of technical skills to understand the programme. It needed an embedded Naval Architect particularly at the design stage of the programme. While we note that the current Project Director engaged consultants to perform this role, this was regrettably too late in the programme.
- c) The project team contains neither financial nor commercial experts. As far as we can tell, financial control of Project Protector overall has been adequate although we have not sought to interrogate the financials for the MRV.
- d) We note the absence of embedded commercial or legal expertise to guide the Project Director. Calling on external legal advice is only a partial solution as summoning such legal advice is largely discretionary. We were surprised to find that only 5.8 man weeks of legal advice was sought on Project Protector during the period since the contract was placed and July 08 i.e. in almost four years during which time some very substantial decisions have been taken on the contract. For the Crown's position to be protected, and for the Project Director and Project Manager to be appropriately advised, commercial experts would need to be a party to key contract correspondence and to attend key project meetings.
- e) Risk assessments were undertaken jointly by the project team and Tenix and on five occasions by an external risk management consultant, approximately six-monthly. While a risk process has been followed, risk management and risk mitigation have not been embedded in the way that the programme has been managed. The absence of formal risk assessments at the time of acceptance or of the sea keeping issues, are cases in point.

- f) At the time of our review, we found the culture of the project team to be more akin to that of a military command rather than a team managing a significant contract and sum of taxpayers' money. At times, junior staff seemed not to have been aware of what, if any, attention had been paid to their advice. We also detected personal antipathies. Project management in acquisition often involves taking decisions where the right course is difficult to select and the consequences of which are enduring. We would like to have found evidence of more open debate within the Project Protector team.

12) We were told that that one of the reasons for the Project Team being kept small was because it was felt that reliance could be placed on both commercial certification and the fixed price contract with Tenix. This was, perhaps, over-simplistic. It should have been evident at the outset to anyone with a knowledge of naval construction that certification would be complicated given that the MRV is a military vessel, albeit one based on a commercial design. Nor too can reliance be placed on a fixed price contract for sorting out all problems. This pre-supposes that the contractor himself has adequately understood all the risks in the programme and is able and willing to bear them. In short, a project team needs to have the range of skills (either embedded within it or access to those skills) to enable it to be an intelligent customer.

Recommendations:

- Acquisition programmes should be reviewed to ensure that they are adequately staffed both in terms of size and specialist skills.
- Commercial experts should be consulted on key correspondence with contractors and attend all key meetings with them.

The Need for Good Governance

13) Better governance above the Project Team may have helped both the understanding and the conduct of the MRV acquisition. There have been, however, significant shortcomings in the governance of the HMNZS CANTERBURY acquisition, exacerbated by some strained relationships between the MoD and NZDF. Reporting of project performance has been generally inadequate.

14) While the approach to governance depends to a degree on what is being governed, there are certain basics for a complex capital programme. We would expect to see the following:

What good looks like:

Review periodically by the project leader's superior, supported by subject matter experts as necessary, of progress against the project plan, project finances and review of risks and their mitigation.

Clear written reports to enable such review to take place.

Competence on the part of the reviewers in the fields of project management, domain technical knowledge, finance and commercial issues.

Active stakeholder management

Timely escalation of key issues to senior management for resolution.

15) In addressing governance, we have considered first the role of acquisition line management and secondly the NZDF/MoD governance structure under the Capability Management Framework 2004 (CMF2004) which was in place for the period of HMNZS CANTERBURY's acquisition.

Acquisition Line Management

16) We understand that Project Director Protector was not subject to routine formal review by Dep Sec (A). The Project Director did, however, provide written reports to Dep Sec (A) following a prescribed format. Dep Sec (A) in turn submitted reports to Sec Def. The latter varied considerably in quality and breadth. The Project Protector briefs submitted by Dep Sec (A) to Sec Def from August 04 are sparse until July 05. There is little information on schedule and risks. There is, surprisingly in our view, no mention at all of contract suspension in March 05. Later briefs include schedule risk information but there is no discussion of risk mitigation.

17) Financial information is provided in Dep Sec (A)'s reports on Project Protector but there is little discussion in these reports of forecasts or explanation of variances. We also note that the financial information is for Project Protector overall. There has been no specific monitoring of HMNZS CANTERBURY's costs against the notional \$100M USD ceiling set by the Government.

18) While we are very conscious of the taut staffing of the MoD's acquisition community, we have not identified within it the degree of challenge and scrutiny required for a programme of the complexity as the MRV. We observe, in addition, that

the reports provided to Sec Def were exclusive to him and not formally disseminated further.

CMF 2004

- 19) CMF2004 describes a hierarchy of committees:
- a) The Capability Development Executive (CDE) which enables interest groups to meet, discuss and solve emerging issues within the acquisition phase of a project.
 - b) The Integrated Capability Management Committee (ICMC) which was charged, among other things, to “monitor project and programme progress against agreed dimensions, risk mitigation and communications”. CMF 2004 also states that “The ICMC reports to ECB on all capability issues except for acquisition (for which Dep Sec A is solely responsible to Sec Def).” At first sight, there could be confusion about reconciling “monitoring progress” with line management responsibilities. We return to this later.
 - c) The Executive Capability Board (ECB) which was and is the key governance body.
- 20) We have considered how these committees discharged their responsibilities for the MRV acquisition.
- a) CDE - we have reviewed the minutes of CDE meetings for Protector between 1 Jul 04-10. Dec 07. CDE’s have discussed issues of the moment but they have not reviewed progress against plan, risks etc. Minutes of 21 May 07 meeting, a critical meeting that has been cited as supporting the decision to accept the MRV, are draft and incomplete. While the intention to accept the ship is noted, there is no evidence of a debate on acceptance (and its risks in view of the defects on the ship at the time).
 - b) ICMC - For the period 4 Oct 05 - 1 Apr 08, the ICMC received no written reports on Project Protector – indeed it received almost no written reports at all from the Acquisition Division. Review of the ICMC minutes shows some discussion of sea keeping issues but there appears to have been no debate on the lifting of the contract suspension (May 05) or of the risks inherent in the acceptance process (May 07). We note that in October 2004 VCDF commented that the ICMC was not receiving adequate reporting. While the ICMC received oral briefing from the then Dep Sec (A), it is difficult to see how it could scrutinise and challenge without written reports as the basis of its work.
 - c) ECB - The ECB discussed the MRV on many occasions. What we have not detected, however, either from review of the minutes or interviews with those present, is evidence of the ECB being able to dig deeply into difficult issues. Overall, ECB discussion can be best characterised by the Acquisition Division seeking to demonstrate that all issues were being adequately addressed and the Navy seeking to ensure that vessels were accepted into service as soon as possible. If there were doubters in the ECB, their voices were not recorded or heard.

21) Many we spoke to commented that the CMF has not worked particularly well for Protector, in part because of poor relationships in places between the MoD and NZDF. It has been suggested that the atmosphere started to deteriorate with the reluctance of the Acquisition Division to explain its selection decision to other Government Agencies, exacerbated by leaks early in the programme (probably from outside the acquisition organisation). Subsequently, relationships soured with the creation of the Naval Authority which seemed to lack independence from the Navy and which, in conducting its new role, undertook work that seemed to cut across the responsibilities of the project team.

22) CMF 2004 will not have helped matters by giving confusing messages on the role of the ICMC. In our view, however, there does not need to be a contradiction between the Dep Sec (A) being solely responsible to Sec Def and the desirability of the acquisition community reporting and discussing project progress and risks to the ICMC. We would regard this as good stakeholder management and an important part of wider NZDF/MoD governance.

23) Whatever the causes, however, we conclude that the basics of good project governance were fundamentally lacking – there was no effective review or challenge to either the Project Director or to Dep Sec (A) and patchy stakeholder management.

24) Improvements to governance should now be made for the remainder of Project Protector and, in view of many of the comments made to us, on the conduct of other acquisition programmes too. At root, there are two imperatives to be balanced. First, the contracting authority (Acquisition Division) should be the only channel of communication with the contractor, sub-contractor and any agencies interested in the conduct of the project. If the NZDF with in-service issues in mind needs to involve other companies in assessments of safety, they should inform the Project Team before so doing. The quid pro quo is that the Acquisition Division must see it as part of its task to have full regard for the in-service concerns of the NZDF and to make it part of their task to communicate effectively with stakeholders. The ICMC should ensure that this is done. We also recommend that the ICMC is tasked formally to review the progress of projects in the acquisition phase, noting that Dep Sec (A) remains responsible to Sec Def.

25) The Naval Authority may not be appropriately placed within the Navy. Some of the friction that occurred with the Acquisition Division stemmed from a perception that the Navy could not split the role of Naval Authority from its interest in getting a ship that met their concept of the capability. As the purpose of the Naval Authority is the provision of independent advice on material safety, it should perhaps be situated outside the RNZN. Consideration should be given to placing the Naval Authority under the Sec Def.

26) If the ICMC and ECB have had a specific shortcoming, it has been in their absence of challenge in what they were being told. Ideally both committees should contain some individuals who are independent with adequate project management, financial and commercial knowledge to question the judgements of those responsible for the project. In view of the taut staffing of the MoD/NZDF, it may not be possible to assemble all the requisite expertise from within those organisations.

A pragmatic course would be for the ECB to include one or more non-executive directors drawn from outside the MoD/NZDF to provide independent challenge.

Recommendations:

- Dep Sec (A) should (a) hold quarterly reviews with his Project Directors and (b) provide written reports on project progress, issues, risks and their mitigation to the ICMC.
- The ICMC should be tasked formally to review the progress of projects in the acquisition phase, noting that Dep Sec (A) remains responsible to Sec Def.
- CDF and Sec Def should issue a joint instruction to their staffs stressing the need to regard acquisition and in-service support as a continuum on which they should work together, and emphasising the importance of stakeholder management.
- The Naval Authority should be independent of the Chief of the Navy
- The ECB should include one or more non-executive directors drawn from outside the MoD/NZDF to provide independent expertise and challenge in the conduct of acquisition programmes.

Roles and Responsibilities: a need for greater clarity

27) We noted a number of cases in which roles and responsibilities were not as clear as they should be in particular at the interface between acquisition and introduction into service. Roles and responsibilities need to be clarified in a number of areas, notably for safety during the acquisition phase and design responsibility throughout the project's life; and improvements could also be made to the ship trials and acceptance process.

28) **Trials and acceptance** - Under the MRV's contractual arrangements, some capabilities (about 10%) were planned to be finally evaluated "off contract" and some fall outside the warranty period. This arrangement has two distinct disadvantages – the contractor may not be held accountable for performance of the ship and its systems, and the project team's expertise may no longer be available to support the programme having discharged its responsibility. An alternative arrangement would be to plan for an additional period of ship's trials with the purpose of system proving before the formal acceptance off contract. We suggest that consideration is given to such an approach for future ship projects.

29) **Safety** - We had expected to find a clear statement in the terms of reference of acquisition staff that, among other things, they are responsible for supplying equipment that is safe to use. We take the view that, notwithstanding other performance issues, safety should be paramount.

30) The Protector Project Director's terms of reference state that he is responsible for "the delivery of the Protector Fleet of Vessels and supporting Deliverables to specification...". While "to specification" may imply "safe", it would be clearer to spell out explicitly the need for equipment to be safe and fit for purpose in ToRs of all Project Managers and Directors.

31) **Design responsibility** - We also found that responsibility for design throughout the life of HMNZS CANTERBURY had not been defined. We had expected to find a clear statement in the contract and elsewhere specifying the Design Authority (DA). We would expect the Design Authority to be the lead technical authority responsible for providing advice on the coherence of the system at all stages of its life.

32) Understanding and defining the DA role becomes particularly important for maintaining configuration control of equipment once in service. Usually the DA would be the body that designed and built the equipment. In the absence of a DA for HMNZS CANTERBURY, the design authority de facto now rests with the Navy.

33) Deliverables under design such as documentation and initial outfit of spares were significantly deficient as high lighted in the Report on Material State on Acceptance. We were advised that the situation had improved significantly during the following 12 months. A number of issues remain outstanding and the provision of low value spares from the original Eastern European suppliers make for a long supply chain. As the Project Protector team has no enduring responsibility for the ship, even routine warranty items frequently fall to the ship to raise. Under the MRV contract neither Tenix nor equipment suppliers were contracted for any enduring technical support either at the equipment level or for any subsequent design integration task.

34) For future acquisition programmes, consideration should be given at the contracting stage to the likely need for the supplier to have a continuing design role for which he can be held accountable. For Project Protector, we recommend that consideration is given to entering into one or more arrangements for design support of the Protector Fleet to maintain the long-term sustainability of the supplier base.

Recommendations:

- For ship acquisition, consideration should be given to planning for an additional period of ship's trials with the purpose of system proving before the formal acceptance off contract.
- An explicit responsibility for procuring safe equipment should be included in Acquisition Staffs' terms of reference.
- The Design Authority role should be defined in future acquisition programmes.
- For the Protector Fleet, consideration should be given to entering into one or more arrangements for design support to maintain the long-term sustainability of the supplier base.

Part 2 - Safety and Functionality

1) In this part of the report, we address the safety and functionality of HMNZS CANTERBURY. HMNZS CANTERBURY is intrinsically safe although some essential remedial work will be required to demonstrate safety, in particular for undertaking some military tasks. Sea keeping performance, however, is likely to be poor in higher sea states. As regards functionality, some operating limitations may have to be accepted but these are not inconsistent with the requirements of the Functional Performance Specification. Some requirements that should have been delivered under the contract may not be deliverable at all. We expand on these views below.

Safety

2) Safety is rarely an absolute – it is nearly always relative. There are three principle requirements to satisfy ship safety – assurance of the material state, safe operating procedures, and the associated training.

3) There is currently a lack of clarity concerning the assurance of the material state of the HMNZS CANTERBURY arising from some confusion on the status of the Lloyd's Register certification, the collective impact of the waivers granted by the Naval Authority (acting as the Flag State Authority), the actual sea keeping characteristics, the damage and loss of RHIBs and the fatal incident. Such lack of clarity has engendered a loss of confidence in the safety of the ship – this is misplaced.

4) The design of the MRV is based on the hull form and associated main machinery of a commercial Ro-Ro design. Both the MRV and *Ben my Chree* were designed by Merwede in the Netherlands. These ships were subjected to the same certification process for both design and construction - indeed both ships have almost identical Lloyd's Register classification. The MRV incorporates a number of specific military features and where such features are outside the formal certification process, (and most are), they are approved or certified by either the Flag State Authority or the RNZN acting for the project team.

5) We have considered the safety of the MRV, firstly as if it were a RoRo Ferry – ignoring the military features and secondly as a military vessel – including the military features.

Safety of the MRV as if it were a Ro-Ro Ferry – ignoring military features

6) Lloyd's Register certification to class is not a certificate of safety. It is, however, a comprehensive statement about the quality of the design process and the subsequent construction phase – including for example compliance with the SOLAS requirements. For the *Ben my Chree*⁴ and the MRV⁵ identical processes were followed by Lloyd's Register under contract to Merwede to ensure that the appropriate design rules were followed, that production drawings reflected the design intent, and that systems and equipments were correctly installed for the required certification, or amended and approved by the Flag State Authority. Practically all ferries around the globe are procured under very similar procedures – although not always under Lloyd's

⁴ Ben my Chree is classified by Lloyd's Register as +100A1, RORO Passenger Ship, , +LMS, UMS;

⁵ HMNZS Canterbury is classified to Lloyd's Register as + 100A1, Ice Class 1C, IWS, +LMC, UMS

Register certification – with qualified surveyors undertaking the certification. It is this application of process that permits a ship to be classified and thus provides intrinsic material safety.

7) There are two material conditions that affect safety that must be addressed before HMNZS CANTERBURY could be regarded as operating as safely a RoRo Ferry. In addition, it is essential to obtain operational advice on ship handling and the propulsion chain when operating in extreme sea conditions from the ship designers.

- a) **The Sea Boat Alcoves.** The MRV's sea boats are located in open alcoves port and starboard, some three metres above the waterline and about three quarters of the ship's length from the bow. Sea boats in such a position would be vulnerable to damage from the ingress and exit of green seas whenever the ship was operating in higher sea states – as the project team was advised pre-contract, during design reviews, witnessed during the MARIN tests and experienced on passage from Rotterdam to Melbourne, before acceptance.
- b) In general, ships' boats are whenever possible located amidships and as far away from the waterline as practical and rarely in alcoves. The reasons are obvious – amidships to limit the effect of pitch during launching/recovery operations, well above the waterline to avoid the ever present possibility of boats being washed away under extreme weather conditions and not in an alcove because in addition to initial shipping of green seas over the boats, a backwash will be generated when trapped green water exits the alcove as the sea falls away, thus increasing the risk of damage or loss of the sea boats.
- c) We found it very surprising that remedial action was not taken to re-site the boats during design development, or if that proved impractical to provide some physical protection for the alcove opening and hence the sea boats.
- d) The loss and damage to the ship's RHIBs on a routine passage in Sea State 6/7 was not surprising and has been the subject of a Court of Inquiry⁶ - we agree with its recommendations. Loss of a sea boat would render the ship unable to complete its role. It has been suggested to us that the RHIBs were lost primarily because of the RNZN's failure to operate the ship prudently. It is certainly true that the MRV is a new capability but it is not fundamentally different to other surface vessels with which the RNZN is experienced. We did, in the course of our review, interview those involved in the Court of Inquiry and reviewed the documentation from the latter. We found no evidence of poor seamanship. The main factors contributing to the loss of the RHIBs were the low position of the alcoves in which they were placed, together with prevailing sea conditions. We understand a design solution is being developed to provide protection to the sea boats in their alcoves – if relocation is not practical.
- e) **The Sea Boats themselves.** The sea boats delivered by Tenix with the MRV were accepted by both Tenix and the MoD as fit for purpose. During a routine training exercise a sea boat capsized following the premature release of the boat rope and the inability to disengage the boat from the lowering gear.

⁶ Court of Inquiry into the loss of the Canterbury's port RHIB on 10 July 2007

Tragically this incident led to the drowning of a member of the ship's company, Bryon Solomon. Other members of the crew were also injured. A Court of Inquiry⁷ made findings as to the cause of the incident but could offer no explanation on why the boat rope prematurely released. We fully endorse the recommendations of the Court of Inquiry which identified a number of material and training shortcomings. The Court's recommendations effectively require the whole system including the boats themselves to be subjected to a review and where necessary re-engineered and re-certification of equipment, in addition to improved training.

- f) While a coroner has yet to establish the cause of the death of Byron Solomon, there is in our judgement no correlation between this fatal incident and intrinsic safety of HMNZS CANTERBURY. The premature release of the boat rope, the difficulty in releasing the sea boat quickly from the hoisting mechanism, coupled with the failure of the self-righting mechanism to operate were an unlikely combination of circumstances.
- g) There is currently a requirement for a rescue boat to meet the SOLAS requirements for HMNZS CANTERBURY. We believe that once the sea boats have been rectified or replaced, they should be able to perform this role. The Naval Authorities should, therefore, consider granting themselves a waiver for the rescue boat requirement.
- h) **Propulsion.** Under more extreme weather conditions – above Beaufort scale 9 (mean wind speed 45 knots and wave height of 7-10 metres), ferry operators generally seek shelter or delay sailing – principally to avoid damage to the cargo and passenger discomfort. In the case of the MRV, while operating in higher sea states (greater than Beaufort scale 8) and dependent upon speed and heading, extreme pitching and heeling will occur, leading to partial or complete propeller emergence in excess of recognised (NATO) standards. In such circumstances one or both main engines could trip and depending on generator configuration, electrical power could be lost at the same time, and hence potentially cause broaching⁸. While the standards to which the MRV and its machinery systems have been designed and materially assured are identical to that for a commercial ferry, the risks of loss of electrical and propulsive power when operating in more extreme weather conditions should have been formally assessed by the ship designers. We believe that Tenix should be formally requested to provide comprehensive advice on issues such as preferred headings/speed combinations or machinery state/line up/modifications, when operating in adverse weather conditions.

8) Given that HMNZS CANTERBURY has been certified by Lloyd's Register, has waivers granted by the Naval Authority, approved safe operating procedures and adequately trained personnel (noting that technical training was provided by the contractor), the ship can be considered as safe and seaworthy as any other vessel in her class. The ship is safe to operate in the same manner as the *Ben*

⁷ Court of Inquiry into the death of AHSO Byron Solomon on 5 October 2007

⁸ To veer or yaw dangerously so as to lie broadside to the waves. Broaching can capsize even a large ship.

my Chree i.e. as if it were a commercial Ro-Ro Ferry. Subject to the comments on the provision of suitable sea boats, the ship is materially safe to operate now within say 150-200 miles of land. Sea keeping performance in the higher sea states is, however, likely to be poor. It would be prudent to seek shelter and/or change course in the higher sea states and avoid Beaufort scale 9 and above entirely.

9) On receipt of advice from the ship designer on the propulsion chain, configuration/changes and heading/speed combinations for higher sea states could be considered without the need to seek shelter – but we would strongly recommend that the ship should be ballasted, as outlined below, when planning operational patrols where such conditions might be encountered.

Recommendations:

- The ship designer should be requested to provide additional guidance to the RNZN on machinery configuration and preferred headings/speed in high sea states both to minimise ship motions and to reduce the risk of loss of propulsion when such conditions are encountered.
- The sea boats should be relocated or if relocation is not practical they should be provided with protection.

Safety as a military vessel

10) To undertake military functions in a safe manner, some key issues remain to be resolved. These are principally associated with equipment performance and sea keeping, and, in particular, the limitations of the ship to shore transfer system. The safe operation of the military functions is an indirect responsibility of Tenix or Merwede but the operating authority – the RNZN - is the responsible authority for the safe operation of each subsystem and where appropriate for systems operating simultaneously. We have commented below on safe procedures for the key issues and sub systems.

- a) **The Rear Door.** The rear door/stern ramp of a ferry or the MRV serves both as a watertight barrier and a ramp across which cargo may be loaded or unloaded. For a ferry, such operations are undertaken whilst the ship is berthed with the ramp accurately positioned onto a firmly secured pontoon. For the MRV, the rear door also acts as watertight barrier but for unloading or loading operations, in the absence of fixed shore facilities, it will be open while the ship is underway.
- b) The ship to shore transfer system requires the Landing Craft (Medium) (LCM) to lower its bow ramp on to the lowered rear door - forming a continuous roadway permitting cargo to be transferred from the MRV to the LCM while underway. There will be unpredictable dynamic movement of the two hulls dependant on the sea state and changes in the displacement of the LCM as it is progressively loaded.
- c) The loads on the MRV ramp are more variable than for a conventional ferry and there is also the risk of mishaps in aligning and positioning of the LCM ramp. While the strength of the rear door (ramp) was examined at an earlier stage, two concerns must be addressed before this system is used operationally – the loads that could be experienced on the MRV's rear door during operations should be re-examined and accepted (including LCM berthing accidents) and the operational conditions and procedures under which the rear door may be open at sea must present risks that are ALARP – as low as reasonably practicable. We advise that operational procedure should be critically re-examined as the consequences of inadvertently flooding the cargo deck are potentially disastrous.
- d) **The Ship to Shore Transfer System.** Based on our observation of the ship to shore transfer system, it has yet to be demonstrated to be “a safe system”. Control of any lateral movement of the LCM, once suspended on the crane hook, is practically zero.
- e) The proximity of a swinging crane hook to the coxswain's wheel house is potentially dangerous, as is manual engagement of lifting strops to the crane hook. During our observations of the transfer system, the MRV was at anchor and yawed significantly even in moderate winds, making alignment of the LCM and lowering of the rear door, virtually impossible. Transfer of loads could not be demonstrated. During re-hoisting, the LCM presented the same hazards and an LCM damaged its seating during re-embarkation.

- f) We doubt that it would possible to operate the current ship to shore transfer system much beyond sea state 2. Considerable limitations will need to apply for safe operation of the Ship to Shore Transfer system relative to the contract requirements. We also are aware that there are some outstanding issues on the certification of the LCM and some cracking of seam welds in the aluminium ramp.
- g) **Sea Boats for Boarding.** The provision of satisfactory sea boats together with their lowering and hoisting gear is a necessary condition for conducting boarding operations. We would expect this to be addressed as part of the Court of Inquiry's recommendations (see para 7 e above).
- h) **Aviation.** The operation of helicopters has already been partially demonstrated but, the assessment of the operation of two helicopters simultaneously must await the planned First of Class Flying Trials. We note that the inability to track helicopters on radar at the required range and height is a warranty claim item.
- i) **Gunnery and Ordnance Safety.** For the primary armament, the magazine arrangements have been adequately addressed by the Naval Authorities and can therefore be considered safe, as has the stowage of ordnance in containers within the cargo space. We note the warranty claim on the alignment of the gun and the searchlight.
- j) **Certification for operating in Global Seas.** The Lloyd's Register's certification of the MRV is for unrestricted operations in Global Seas. Such certification is based on the understanding that the MRV does not operate in a particular sea area for a disproportionate amount of time, and that the vessel is operated in a prudent manner – minimising slamming loads, propeller emergence and the effects of green seas on the exposed equipments. Lloyd's Register would need to provide advice to NZ MoD once the operating pattern for the ship has been established to ensure the Certification in Global Seas has not been compromised by the proposed operational profile. We do not believe this to be a serious issue.
- k) **Additional Ballasting.** The vertical accelerations experienced by the *Ben my Chree* following delivery were of such a magnitude that its owners located permanent ballast high up to raise the centre of gravity that in turn attenuates such motions. Similar action for HMNZS CANTERBURY would reduce vertical acceleration and improve crew comfort and the ability to operate helicopters in all sea states.
- l) For much of the ship's operational time it will be "lightly loaded" i.e. the cargo load will be small. In such a configuration, the ship will experience more extreme motions in all sea states. Such conditions would be reduced if the ship were ballasted to the design draught. In this configuration the ship's roll damping system should perform in a satisfactory manner – in the lightly loaded condition it is practically ineffective.
- m) Such changes are indirectly related to safety as they would improve the effectiveness of the ship's company and the embarked civilian or military staff. For the RNZN, a more user-friendly ship is likely to be beneficial in view of its planned use for training.

- n) **Replenishment at Sea.** We understand that a safe operation to act as both a receiving and donor ship has yet to be demonstrated. The location of the fluid RAS point well aft will be challenging and require the development of appropriate procedures.

Recommendations:

- Advice from Lloyd's Register should be sought to secure Global Seas Operation for the desired operating profile.
- Additional ballast should be added to the ship to reduce vertical accelerations.
- Arrangements for ballasting the ship should be incorporated to maintain its design draught when lightly loaded.

Functionality

11) The MRV's functionality as required by the NZDF and other government agencies is detailed in the Functional and Performance Specification. HMNZS CANTERBURY was not contracted or built to the FPS, but to the Contract between MoD and Tenix. We had expected the NZDF to have conducted a formal review of actual performance against the FPS as opposed to compliance against the contract deliverables – but were advised this had not been undertaken. Theoretically, the contract should mirror the FPS but, as reported below, this is not always the case. In the absence of such a review, this task was undertaken under the direction of the Review Team by staff seconded from the NZDF. An edited version of the report is at Annex D. The compliance of the ship's performance against the FPS (which should be regarded as preliminary) has been forwarded to AC Dev who should now see the process through to its formal conclusion.

- a) This report identified about 600 clauses containing a capability requirement for the MRV expressed as mandatory (shall) non-binding (should) or permissive (desirable). Of these about 71% of the functionality has been achieved, 9% partially achieved, about 10% not achieved, and 9% not yet demonstrated; the remainder do not have an identifiable deliverable.
- b) Of the 9% partially achieved some cannot yet be fully evaluated, others are none binding or permissive requirements, others will be resolved following installation of sea boats or resolution of warranty issues. The very small number of failing mandatory requirements is not judged to be significant (bar one) in the overall context of the MRV's functional capability. The significant requirement that appears not to have been met is the strength of the accommodation ladder to permit a fully laden soldier to embark from the shore. It is not clear if this remains a current requirement or not.
- c) Of the 10% that have "not been achieved" practically all are covered by warranty claims, or should be achieved once the necessary changes detailed elsewhere in this review are completed (boat alcoves, sea boats and hoisting/lowering gear, machinery/changes etc).
- d) There are a few items where the functionality required by the FPS is also a deliverable under the contract but has not been delivered. For reasons that are not entirely clear, the project team has accepted a lesser capability as a contract deliverable. A huge number of contract deliverables associated with verification were accepted without the full rigour necessary just prior to formal acceptance. It is probable that some specific requirements may have been inadvertently overlooked in the run up to formal acceptance off contract.
- e) About 9% of the required functionality has yet to be demonstrated – largely due to warranty items not being resolved or HMNZS CANTERBURY not yet having undertaken sufficient operational proving. We would expect such functionality to be achieved.
- f) Compliance of contract deliverables should have ensured compliance with the FPS. However the acceptance of contract deliverables was prescribed by the verification and acceptance plan that defined the acceptance methodology to be adopted for each deliverable – some by analysis, others by testing. From an

examination of this matrix, it is evident the vast majority of deliverables were finally agreed post acceptance. As previously mentioned, the Verification and Acceptance component of the project team was considerably over-stretched.

12) Our overall view is that the functionality required by the NZDF has or will be achieved. HMNZS CANTERBURY will, following remedial work as outlined elsewhere, be able to discharge all her operational roles as required in the FPS. The ship will exhibit poor sea keeping qualities for ocean patrolling in the higher sea states but, over time, the RNZN should be able to develop practices and procedure to accommodate the sea keeping performance. Some of the deliverables required under the contract may never be delivered - and this will need to be resolved as part of the settlement of the warranty claim.

Recommendation:

- AC Dev should be assigned formal responsibility for completing the work commenced on compliance of the Functional Performance Specification with the delivered ship.

Part 3 – The Way Ahead

1) In this report we have made a series of recommendations on project management and governance based on lessons from HMNZS CANTERBURY's acquisition and introduction into service, provided an assessment of the safety and functionality of HMNZS CANTERBURY and recommended areas of safety and functionality that should be addressed. In this final section of the report we consider the way ahead.

2) It is important that the issues arising from this review are gripped and taken forward in a treatment phase or "get well" programme. We suggest that it is also important in the light of concerns about HMNZS CANTERBURY that effective action is seen to be taken.

3) We envisage three work streams; - a Governance work stream, a HMNZS CANTERBURY "Get Well Team" and a HMNZS CANTERBURY Strategy Team. These activities should be led by competent officials, fully resourced, with clear programmes of work, and reporting to senior MoD/NZDF management.

Governance

4) The purpose of the Governance work stream would be to ensure the implementation of all accepted recommendations in section 1. It should be led by a nominated senior official assisted by Dep Sec (A) and AC Dev. We suggest that duration of 12 weeks should be adequate for the implementation of most recommendations. Guidance could be provided as necessary by VCDF and Dep (Sec) (P&P) with a final report to CDF and Sec Def on the completion of its work.

HMNZS CANTERBURY Get Well Team

5) The purpose of this team would be to develop and implement solutions to achieve the functionality of the HMNZS CANTERBURY. The work of this team should be conducted with the Warranty claim in mind i.e. to do minimum necessary to improve HMNZS CANTERBURY's ability to meet the Functional Performance Specification. It should be seen as the MoD taking action equivalent to purchasing in default.

6) The team would address the issues below; a number of which are currently being actively pursued under the warranty claim:

- Boats
- Alcoves
- LCMs
- Propulsion chain
- Re-certification, if any is required.
- Aviation facilities
- RAS arrangements
- Ship/shore transfer system
- Ballast requirements
- Advice on sea keeping/patrol patterns

7) It could also take the ship through to full operational capability and, in effect, be the Scheduling Authority.

8) We suggest that the team should be provided with a provisional budget e.g. a ceiling of NZ\$20M, tasked with defining the financial requirement in greater detail and set 12 months to complete its work. The team would report to CDF and Sec Def jointly.

9) We have considered where the team might be placed in the NZDF/MoD organisation. On balance, we feel that it should ideally stand outside the Navy, who might be felt to have an interest in going beyond the FPS, and also outside the current Protector team which some may feel would be overly influenced by its own past decision-making on the project. In view of the need for close association with the finalisation of Project Protector and the resolution of the warranty claim, we suggest a stand-alone team, located in the Acquisition branch, albeit reporting directly to CDF and Sec Def.

Strategy

10) The purpose of this work stream would be to develop a strategy for moving forward with Tenix on HMNZS CANTERBURY in the context of the Protector. It would need to consider the warranty claim, the additional costs being incurred as part of the Get Well Programme, Tenix's motivations and the future relationship which the New Zealand Government may wish to have with the company's new owners – BAE Systems - given the need to support Protector ships once in-service.

11) We see this team comprising 2-3 individuals at about one star level or with that potential. One would need to be person who would eventually lead the negotiations with Tenix. Initially, the work would be of a short duration e.g. 5-6 weeks, to provide a strategy for MoD/Crown negotiators to employ with Tenix.

Recommendation:

- That work streams be set up to implement the project management/governance recommendations in this report; implement a HMNZS CANTERBURY Get Well Programme, and develop a strategy for moving forward with Tenix.

List of Annexes

Annex A – Terms of Reference

Annex B – List of those interviewed (not included)

Annex C – MRV Key Events

Annex D – Summary of Analysis of Functional Performance Specification