

# Canterbury tales re-told: RNZN multirole vessel delivers

**Date Posted:** 08-Jun-2016

**Publication:** Jane's International Defence Review

**After being plagued with issues that resulted in an early and extensive remediation programme to correct deficiencies, the RNZN multirole vessel HMNZS *Canterbury* is now proving its worth as an essential capability supporting a wide range of operational scenarios. *Kate Tringham reports***

Within the space of a year, the South Pacific archipelagic countries of Vanuatu and Fiji bore the brunt of two of the most powerful tropical cyclones to hit the southern hemisphere. On 13 March 2015 Vanuatu suffered extensive damage when Tropical Cyclone Pam struck with category 5 force, killing an estimated 17 people and leaving 65,000 homeless.

Less than one year later, in what was to become one of the most disastrous South Pacific tropical cyclones in recorded history, Tropical Cyclone Winston tore through Fiji on 20 February, striking the island with 10-minute sustained winds of 230 km/h and waves up to 12 m. Winston inflicted extensive damage that saw 44 killed and approximately 350,000 displaced - roughly 45% of Fiji's population. Total damage amounted to USD1.4 billion, and a state of emergency, announced on 20 February, remained in place for 60 days.

In the following weeks, the New Zealand government contributed logistical support and relief packages to assist with humanitarian assistance and disaster relief (HADR) efforts. Both operations saw the Royal New Zealand Navy's (RNZN's) multirole vessel (MRV) HMNZS *Canterbury* play a vital part, deploying to the islands for extended missions lasting more than a month, carrying hundreds of tonnes of food, water and emergency supplies, plus embarked personnel, helicopters - the navy's SH-2G Super Seaprites for Vanuatu, adding the air force's NHIndustries NH90s for Fiji - and landing craft.



*HMNZS Canterbury arrives in Port Vila, the capital of Vanuatu, on 25 March 2015 to offload 150 tonnes of food and other supplies in support of relief efforts in the aftermath of Tropical Cyclone Pam. (New Zealand Defence Force)*

1639426

Both operations were considered to be a joint effort, with New Zealand Defence Force (NZDF) personnel drawn from all three services working together to deliver relief and to support the recovery effort, alongside teams from other government agencies. For many of *Canterbury*'s ship's company and embarked forces, the disasters were the first deployments of the type they had been involved in.

The operations, however, were just the kind of disaster relief effort for which the MRV requirement had been written, and served to demonstrate that the ship provides a strong and effective platform for an HADR operation in the region. In addition, the operations also presented an early test of the amphibious element of the NZDF's Joint Task Force (JTF) concept, for which *Canterbury* is the centrepiece, and served to show the significant progress that has been made by the NZDF over the last few years as it builds up the capability and expertise to operate as a JTF.

"I think *Canterbury* delivers a capability that is unmatched, in that we now possess the ability to project forces strategically by sea for the entire NZDF capability, ranging from land combat, if required, through to medium- to heavy-lift helicopters, and of course, HADR in and around our region," Commander Simon Rooke, *Canterbury*'s commanding officer, told *IHS Jane's* on 25 May 2016. "In essence, we didn't have anything that could do that before, and now we've got a ship that has delivered successfully through a range of exercises, and of late, in the two tropical cyclone disasters that have occurred in our region. We now have that level of capability."

This validation of *Canterbury*'s utility in the type of operation it was acquired for is a welcome result for a vessel that has emerged from troubled beginnings, when a raft of issues necessitated a remedial programme to be put in place.

### **'Project Protector'**

*Canterbury* was the first of seven ships to be commissioned into the RNZN between 2007 and 2010 as part of its 'Project Protector' acquisition programme. 'Project Protector' was largely shaped by a series of reviews of New Zealand's maritime security strategy, in particular the Maritime Forces Review (MFR) released in January 2002. The MFR identified a number of requirements that were unable to be fulfilled by existing RNZN capabilities, foremost of which was an extended patrol capability to protect the country's vast 4,000,000 sq km Exclusive Economic Zone (EEZ) - one of the world's largest - and its search-and-rescue (SAR) region, as well as interests in the Southern Ocean and the Ross Dependency in the Antarctic. Also identified was a requirement to assist other South Pacific states with EEZ protection and stability operations.

To allow the navy to meet its responsibilities, the review led to a decision to proceed with the 'Project Protector' fleet renewal programme, which envisioned the acquisition of three types of ship, the largest being an MRV intended to reinstate a limited tactical sealift and amphibious capability for military operations, civil evacuations, disaster relief tasks, and development assistance in the Asia-Pacific and South Pacific regions. The procurement programme also included two 1,600-ton offshore patrol vessels (OPVs) to undertake maritime security and surveillance tasks in New Zealand's EEZ, and four smaller 340-ton inshore patrol vessels (IPVs) to operate in waters out to 24 n miles.

Following a two-year information-gathering and tender process, in 2004 the Ministry of Defence awarded a NZD500 million (USD340 million) contract to Australian company Tenix Defence (now BAE Systems Australia). 'Project Protector' has been the most complex project undertaken in New Zealand, with three ship classes (plus embarked small craft) being built across three countries.

The 131 m-long MRV *Canterbury* is a modified roll-on/roll-off (ro/ro) passenger ferry design from Dutch shipyard Merwede; it was constructed in the Netherlands, fitted out in Australia at the then Tenix facility in Williamstown, Victoria, and commissioned on 12 June 2007. The ice-strengthened vessel can transport a heavy company of 250 troops plus equipment and stores, and support them ashore for 30 days. Stowage for the New Zealand Army's 8x8 light armoured and soft-skinned vehicles, or 33 standard 20-ft containers, is provided by 403 lane metres of deck space. Two landing craft medium (LCM) are located amidships. One SH-2G Super Seasprite and up to four NH90 helicopters can be embarked in the hangar. Armament is provided primarily for self-defence and consists of a remote-controlled 25 mm lightweight naval gun in a Typhoon mounting and two 12.7-inch machine guns.

Even before *Canterbury* was commissioned there were ongoing concerns, negotiations, and redesign activities regarding its performance in heavy seas - challenges that had been thrown up during the ship's initial journey to Australia from the Netherlands, and, in fact, even before construction had begun. Then, just one month after commissioning, *Canterbury* lost a rigid-hull inflatable boat (RHIB) after water swamped the port-side boat alcove and in October 2007 another RHIB capsized alongside the ship, resulting in the death of a sailor.

The incidents led to two separate court of inquiry investigations and an independent review into *Canterbury*'s acquisition and introduction into service, focusing on the ship's safety and functionality. Led by John Coles, formerly chief executive of the UK's Warship Support Agency, the report, published on 12 September 2008, attributed many of the ship's design issues to the decision to select a cheaper commercial ro/ro design rather than a purpose-built military vessel. According to Coles and his review team, *Canterbury*'s acquisition was "constrained ... 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".

Problems identified included ballast and propulsion issues that led to poor handling in rough conditions, issues with the landing craft design, and radar deficiencies. The report concluded, however, that there was no connection between design performance issues and the sailor's death.

The report judged the ship as "intrinsically safe", but "unlikely to meet all of the requirements" of the delivery contract awarded to Tenix Defence Systems in July 2004, concluding that remedial work would be required to enable it to perform military functions. The report noted that, even when the improvements were completed, the navy will have to impose operating limitations on the ship, and that its sea-keeping "is likely to be poorer in higher sea states".

Merwede Shipyard had based its MRV design for *Canterbury* on its ro/ro ferry *Ben-My-Chree*, a 125 m-long, 12,504 gross register tonnage (grt) vessel built in 1998 and operated in the Irish Sea by the Isle of Man Steam Packet Company. This marked the start of all *Canterbury*'s problems, according to Coles and his review team.

"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 for the design for the MRV," the report stated. "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."

In 2010 the New Zealand government, which was also concerned about problems with the Otago-class patrol vessels, initiated mediation proceedings against BAE Systems Australia and as a result the shipbuilder agreed to pay NZD84.6 million to the Crown in settlement.

### **Remedial work**

The remediation programme is now nearing completion and is scheduled to conclude in September 2016.



*As HMNZS Canterbury's remediation programme nears completion, the RNZN has finally started to harness the benefits of its new asset in recent operations and exercises. (New Zealand Defence Force)*

1645686

The work has been undertaken in two phases. The first phase, approved in July 2010, included the establishment of a project team, design, and feasibility studies as well as the implementation of some immediate safety changes that included relocating *Canterbury*'s sea boats, remediation of the ship's main engines performance in high sea states, and interim upgrades to its LCM boats, cranes, and air radar.

The second phase, approved in March 2011, involved implementing the remedial solutions to *Canterbury* and the rest of the Protector fleet. Work on *Canterbury* has been completed under six priority areas: sea-keeping (hull performance, ship handling, and stability); the ship-to-shore transfer system; mission systems; aviation integration; medical systems; and safety and compliance items. Due to the ship's operational commitments, remediation work has been scheduled to take place during scheduled maintenance periods.

Work under sea-keeping is nearing completion. Modifications to the ship's ballast tank are in the final stages and will be completed in the next docking period in September 2016. Modifications to the engine control system have effectively remediated concerns with respect to its engine lubrication system.

The reconfigured RHIB launching system is also complete and certified as a SOLAS/LRS fast rescue boat. From an operational perspective, the boat system is fully configured for naval operations, with the most demanding requirement being to perform as a helicopter crash boat; actual performance will be determined through Operational Test and Evaluations (OT&E) currently under way. Automated gangways and shell doors have also been installed and commissioned.

The original RHIBs have been replaced with a model that has been proven in service with the Royal Australian Navy (RAN); this change has been adopted across the Protector fleet.

*Canterbury* 's landing craft have been upgraded; the replacement lifting structure, bow ramp, and revised ballast system work has been completed and the LCMs are currently undertaking OT&E. Appropriate facilities have been installed on the ship to enable the LCMs to be secured alongside to enable loading by the ship's cranes and through the new shell doors. A weight-reduction programme, including replacement of the steel ballast system with a lighter weight material, means the LCM weights are now nearer the currently approved limits of *Canterbury* 's cranes.

The ship's cranes have been upgraded to a safe working load of 65 tonnes to provide additional flexibility for LCM launch and recovery. Work is scheduled for completion in July 2016. The launch and recovery of the LCM was considered hazardous, with the LCM acting as a pendulous weight on the ship's cranes. To remedy this, an automated line handling system has been installed.

Mission systems work has included the improvement of *Canterbury* 's echo sounder to ensure the crew receives accurate information on the depths in which the ship is operating. The echo sounder has been installed, tested, and completed.

In addition, the relocation of the starboard alcove in conjunction with earlier work to resize the hangar doors has resulted in a full reconfiguration of the aviation facilities suitable for operating NH90 helicopters as well as the Super Seasprites. Two NH90 helicopters deployed successfully on Exercise 'Talisman Sabre' in Australia during 2015 and were also deployed on *Canterbury* as part of the New Zealand government's response to Cyclone Winston.

The existing AIMS-ISR display system provides the tactical picture within the Protector Fleet. Seven Daronmont Technologies Karearea Communication Detection Systems provide intercept, location, and display of radio transmissions. All systems have been installed and are operational. A Defence Technology Agency Radar Detection System (Teki II) has been installed across the Protector fleet.

*Canterbury* 's legacy MSI-Defence Systems 25 mm Seahawk gun mount has been replaced with a Rafael Typhoon weapon station, and a TopLite electro-optical targeting system has been added to improve situational awareness. These have also been installed on the Otago-class OPVs. In addition, TopLite systems have been installed and accepted on the four Lake-class IPV's.

Three Wide-Angle Subsurface Profile systems have been delivered, comprising a tender-mounted multi-beam echo sounder with wireless connection to the host ship or unit. The systems provide real-time 2-D and 3-D imaging of ocean flow.

An integrated radar system has been designed, installed, and tested to provide an aviation airspace management capability for *Canterbury* and the OPVs. In many ways the system resembles that of a medium-sized regional airport. The system is based on commercial radar ADSB and commercial off-the-shelf (COTS) equipment from SSR Engineering to provide an integrated picture to the aircraft controller.

Finally, *Canterbury* 's surgical capacity has been fully outfitted to provide a comprehensive level 2+ surgical facility including the provision of cardiac safe power systems. The systems have been installed, were certified during Exercise 'Southern Katipo' 2013/2015, and have been operationally released.

Speaking to *IHS Jane's* in March 2015 as the remediation programme was nearing completion, then chief of navy Rear Admiral Jack Steer said he considered the vessel a success.

" *Canterbury* has had some bad press," he acknowledged, "but it's like any new ship. We had to learn how to use it, to understand its capabilities and limitations, and just become more familiar with operating a large ferry, and now that we've figured it out, it's a huge success .... We've taken the basic ship and made some improvements to make it more operationally capable for us, and it's turned out really well."

While the requirement for sea-keeping in extremely heavy seas will not be met, the navy insists that such conditions are unlikely to be encountered in the ship's planned operational area.

Meanwhile, Cdr Rooke said that he was "completely confident" that the work has undertaken to an acceptable standard. "Certainly, during my 18 months as commanding officer for *Canterbury* so far, I haven't come across any issues with any of the remediated aspects of the ship," he said.

### **Roles and operations**

Even before *Canterbury* started the second and main phase of its remediation programme, the ship was provided with early opportunities to demonstrate its sealift capabilities and wider utility as an RNZN asset. In 2009 it provided humanitarian assistance for a three-week period in the wake of the Samoan tsunami. Then, on 22 February 2011, a 6.3 magnitude earthquake hit Christchurch - New Zealand's largest city - claiming the lives of 185 people and leaving thousands homeless. In the weeks that followed, *Canterbury* ferried 1,700 tonnes of civil defence, reconstruction, and other HADR equipment and stores, as well as 400 passengers, to and from the capital, Wellington.

However, due to their sheer scale, it was not until the two recent cyclone disasters that *Canterbury* was able to demonstrate one of its core functions as the centrepiece of the NZDF's JTF concept, providing the amphibious task force element. The JTF was enshrined as a core element in the NZDF's 2011 Defence Capability Plan and its updated iteration in 2014. These documents are shaping force developments out to 2035, with the focus on an NZDF that is combat capable, maritime in outlook, and expeditionary in nature.

Rear Adm Steer described the JTF as "the concept of the whole defence force working together, and understanding how we all operate. Everyone now has to understand how to operate on the water, and we practice this. We don't have a standing task force like NATO; rather, it's the ability of the NZDF to get around - generally on *Canterbury* - to load it up, put helicopters and boats on it, and then send it off somewhere.

"It has a multitude of uses. There's obviously the combat use, but there's also the [humanitarian aid work]", such as that carried out in Vanuatu and Fiji, said Rear Adm Steer.

Development of the JTF is being staged over a number of years. The first stage, which set 2015 as its headmark, involved reorganising existing frontline operational and support units to create an operational JTF able to work independently in the South Pacific - as was demonstrated in Vanuatu and Fiji - or as part of a coalition further afield.

In this respect, Cdr Rooke said the JTF concept has today reached the required level of capability, "in that we've proven our ability through exercises and real-world events to both interact with our regional partners and also, on a smaller scale, to go it alone, in terms of projecting a joint capability and controlling that JTF from *Canterbury* or from forward-based command and control [C2] if *Canterbury* is used more as a maritime staging platform with C2 capability elsewhere," he said.

"The example I can [offer] is that in Fiji and Vanuatu it was proven to put our deployable joint force command element in the New Zealand High Commission in the affected country, and then *Canterbury* and the embarked air force were then commanded remotely, with myself as the amphibious task force commander. In Vanuatu it was a single ship but in Fiji it was a multi-ship [deployment], so we didn't have our C2 on board, but we were able to communicate to them in their deployed headquarters."

Cdr Rooke described the ship's missions in Vanuatu and Fiji as "huge successes".

"Talking specifically about Vanuatu, we were able to rapidly load and embark both the equipment and personnel for a whole of government response. We had a full engineering company on board, and in that instance just a ship's aviation capability - we took a couple of [SH-2G] Seasprite helicopters. We were able to operate off a remote set of islands that were geographically dispersed: there were seven islands we were servicing in an area about 100 n miles north to south," said Cdr Rooke. In this scenario *Canterbury* was able to operate at anchor and under way, deploying forces by landing craft and helicopter, to support the reconstruction effort.

During the Fiji humanitarian aid effort another milestone was achieved, with *Canterbury* transporting two NH90 helicopters that then worked out of a forward operating base in the country. "So that was another feather in our cap in terms of realising the capability of *Canterbury* and the JTF," noted Cdr Rooke.

The Fiji mission also saw *Canterbury* operating at twice the distance from the main island, compared with the previous year's effort. In Vanuatu the ship operated about 60-90 miles from Port Vila, the capital, whereas in Fiji *Canterbury* operated nearly 150 miles away. "So we were more isolated. One of the things we had to do this year was to sea-base the majority of our personnel. While we had an operating base set up on the biggest island we were operating from, we were actually bringing the majority of troops back onto the ship each night and then projecting them ashore again in the morning, because we didn't want to overwhelm the local infrastructure that was obviously struggling after the cyclone. In that respect sea-basing was a concept we managed to prove very successfully, in that we could project capability ashore."

Cdr Rooke said the Fiji mission was also notable in terms of demonstrating the ability to project power as a true joint capability that was controlled as a whole-of-government response. A week after the storm struck the Otago-class OPV HMNZS *Wellington* arrived carrying 70 tonnes of aid, as well as hydrographic and diving teams, and army engineers that were able to carry out rapid environmental force work, including identifying the route into and anchorage within Vanuabalavu lagoon where *Canterbury* deployed. Meanwhile, RNZAF P-3K2 Orion aircraft provided detailed photographic surveillance. "When *Canterbury* turned up four days later we were able to go in and start work straight away. So that was a real joint capability effort."

In terms of what was required in a disaster relief scenario, Cdr Rooke did not think *Canterbury* was limited by anything other than the capabilities of her design. "That's not a negative statement, it's just the fact that she is a ship designed to carry up to 250 troops and up to 400 lane metres of vehicles, but we were able to maintain ourselves on station for more than a month. We didn't have any issues around endurance or fuel endurance. We didn't come across any issues with operating the helicopters. We had another smaller cyclone come through while we were there and we rode that out at anchor at the lagoon and continued to operate the helicopters throughout. It was one of those things where everything went well. As you do, we had some minor maintenance issues going along, but we managed to overcome those. It was the thrill of my naval career so far, being

able to command *Canterbury* through that relief effort."

Meanwhile, the NZDF continues to use national and international exercises to grow its JTF capabilities, drawing on lessons learned to inform its efforts.



*A Rheinmetall MAN truck is loaded onto HMNZS Canterbury prior to deployment to Australia for Exercise 'Talisman Sabre' on 11 June 2015. (New Zealand Defence Force)*

1639529

A key milestone took place from 5-21 July 2015 when the NZDF participated in Exercise 'Talisman Sabre'. A large Australian Defence Force exercise conducted with US 7th Fleet across multiple training areas in Australia and the United States, 'Talisman Sabre' covers training on land and in the air, and maritime warfare including amphibious operations. It was the first time New Zealand had participated fully in the biennial exercise, contributing two ships (including *Canterbury*), four aircraft, around 45 military vehicles (including 22 light armoured vehicles), and 620 personnel.

"'Talisman Sabre' was a highly successful event in terms of strategic sealift objectives," Cdr Rooke said. "We projected a land combat capability from New Zealand to Australia: a 1,300-1,400 n mile transit. It was the first time we embarked NH90s on board *Canterbury* and deployed overseas. We also took a fully embarked force, so there were 365 of us on board when we departed. There were no major issues we came across, although there were plenty of learning points in terms of helicopter storage and stowing and movement and so on. When we took the NH90s to Fiji none of those points were relearned, so it was ideal."

In November 2015 New Zealand conducted its major training exercise for the year, 'Southern Katipo': a series of steps undertaken every two years to grow the JTF capability. The 2015 iteration of the exercise, involving more than 2,000 personnel from nine countries, was designed to test the NZDF's ability to work with other militaries in response to humanitarian and security emergencies in the Southwest Pacific.

"'Southern Katipo' was a good exercise in terms of testing the ship, because we had to operate over a couple of different beaches and geographically dispersed areas," Cdr Rooke said. "It was also the first time we'd taken and landed over the beach the army's new MHOVs [medium- to heavy-operating vehicles]. We were able to put those ashore via landing craft by day and night. We also conducted a major and un-alerted non-combatant evacuation operation where we were tasked to take just over 150 civilians representing displaced persons in a refugee camp, take them to sea and then look after them for a 24-hour period before returning them to shore."

### Looking ahead

In terms of *Canterbury*'s OT&E programme, the major work remaining will be the integration of the NH90 for under way flying, Cdr Rooke said.



*One of the RNZAF's new NH90 helicopters operates from the flight deck of HMNZS Canterbury in Fiji in 2015. (New Zealand Defence Force)*

1645685

"At the moment, the NH90 capability is static flying alongside. That's not a *Canterbury* -specific issue, it's the combined capability of the ship and aircraft. The air force has released the capability to embark the NH90 onto *Canterbury* and then to project onto a forward operating base. The next step, for which we will be doing trials later this year [2016] or, depending on sequencing, early next year, will be initially at anchor and then under way within a limited helicopter operating envelope of putting the NH90s on and off while the ship is moving through the water. That's probably the next big step in terms of our trials programme. There are no other major trials that we still have outstanding." Next year will also see first-of-class flying trials conducted for the NZDF's newly acquired Kaman SH-2G(I) Super Seasprites, purchased to replace the SH-2G platforms.

Going forward, *Canterbury* will continue to develop its JTF capabilities through continued participation in national and international exercises. The 'Southern Katipo' exercises will remain a major feature in the ship's calendar. As the NZDF's major amphibious JTF-related exercise, it

enables the force to measure where it is against its strategic journey towards Future 35, when the NZDF will have a fully integrated capability.

"So it's 'more of the same', in terms of what we have planned for *Canterbury* over the next few years, with the aim that we continue to grow in our knowledge of the ship and employing her more effectively and more efficiently in delivering what she needs to deliver to government," Cdr Rooke said.

In conclusion, Cdr Rooke added that he had not known what to expect when he took command of *Canterbury* 18 months ago, having come from a frigate background.

"For me, the most amazing thing has been how complex amphibious warfare is, but how well *Canterbury* has performed as a platform to deliver that within the New Zealand context. We're talking about a benign, low-threat environment, primarily focused at this stage around sealift and HADR, but in that respect the ship is an amazing capability that I had no real appreciation of until I took command of it. It's a fantastic increase in the broad capability of our navy and our defence force."

#### COMMENT

New Zealand's force development out to 2035 is focused on the creation of an NZDF that is combat-capable, maritime in outlook, and expeditionary in nature, with the JTF at the core and *Canterbury* being the centrepiece of the amphibious task force element. As outlined in the objectives of the 2010 White Paper and subsequent defence capability plans, development to 2015 involved reorganising existing frontline units to create an operational JTF able to work independently in the South Pacific (as demonstrated during the Vanuatu and Fiji efforts), or as part of a larger coalition further afield. Moving forward, the key focus up to 2020 will be on developing an enhanced combat capability. This is planned to be delivered through enhancements in C4ISR and littoral capabilities that will provide forces with improved reconnaissance and environmental assessment means. Combined with a new Maritime Sustainment Capability and an upgraded Air Mobility Capability, forces will then be more deployable in the South Pacific. To achieve this, training exercises, around which *Canterbury* will play a key role, will continue to emphasise tri-service interoperability so that the amphibious task force command teams and land force command teams develop and improve their ability to operate together seamlessly.