

TE KOTUKU

NEW QUEEN OF THE FLEET

BY KEITH INGRAM, PHOTOS BY JACQUIE O'NEILL



Public passenger transport remains a constant topic of debate among commuters – who are often its strongest critics.

Frequently discussion focuses on the company, cost, the service (or lack there of) and how things 'should' be improved. Many commuters are, in fact, armchair experts on public transport, whether on land, air, or sea.

When the principle ferry service provider on Auckland's Waitemata harbour, Fullers Group of Auckland, was looking to upgrade its current fleet they took the brave step of surveying their customers and crew – and was pleasantly surprised with the amount of constructive and valuable feedback they received. With this worthwhile information in hand, Fullers set out on the very expensive journey of committing to upgrade its aging fleet.

Yes, it's an expensive exercise – far more costly than the equivalent for, say, a bus operator. The company's business case included major half-life refits of both *Harbour Cat* and *Tiger Cat*. These two vessels were completely stripped out, re-powered, and fully refurbished. (Refer to *Professional Skipper* issues 96 and 91.) Suitable near-new vessels were purchased from Australia and added to the fleet.

The major refurbishments and re-powers continued up the line as vessel after vessel was given a new lease on life.



The new panoramic bridge design

NEW BUILDS

The company identified a growing need for a new mid-range vessel to support the growing Waiheke and Half Moon Bay services. It also needed a back-up to the Devonport 'tram' (more correctly, *Seabus Kea*) on the short cross-harbour service.

Traditionally Fullers has sourced its new fast ferries from Australia. As such, the company has a number of Crowther-designed vessels in the fleet, including its first, the ever-faithful *QuickCat*. But on this occasion, Fullers owner Sir Brian Souter encouraged the management to look at building



The main bridge wing controls

locally, here in New Zealand.

Wanganui-based shipyard Q-west, having worked with the Crowther design house in Australia before, was an obvious choice. Not only this, but such a purchase would also put money into the local economy. Another win. This said, Fullers is a commercial business. Q-west had to be competitive with the Australian yards. The strong New Zealand dollar and good exchange rate assisted Q-west by creating a level playing field. These factors, coupled with Q-west's proven history of building fast ferries and tourist vessels, gave Fullers confidence that ▶

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One of the two onboard cafes



A sheltered open air upper deck



The main companion way up top

the yard could deliver on-budget and near enough on-time – although the seasonal equinoctial weather did, in the event, cause some frustrating delays in delivery.

This would be the largest power vessel Q-west had built – and the largest fast passenger ferry to be constructed in New Zealand.

CONSTRUCTION

Displacing some 130 tonnes, *Te Kotuku* is constructed in 5083 marine grade aluminium, using a range of plate thicknesses from 12mm bottoms to 4mm in the cabin topsides. The vessel is strongly constructed, incorporating the straight stem or 'axe' bow and a displacement low-wash hull design in preparation for the arduous years of scheduled commuter work ahead.

Next to speed and comfort, windows are the next most important feature. *Te Kotuku* is surveyed to carry 330 passengers seated plus 70 standing. Commuters and tourists alike demand to be able to see out while seated. The Crowther design has ensured that there are large windows to both passenger decks. In building this vessel, Fullers has tried to capture many big boat features while retaining the best from its smaller vessels.

In walking around the vessel, we note the Palfinger PK4501M knuckle boom crane on the foredeck. This sturdy little crane has a 7.1m reach capable of lifting 520kgs at full stretch, or 1130kgs at 3.6m – which is more than adequate to handle the four weather-protected cargo boxes designed to be carried on deck.

The bridge features three large reverse sheer forward-facing windows – incorporating thicker glass and fast-acting wipers. This move was in response to a crew recommendation in an effort to improve visibility by reducing glare – while also recognising that the harbour is getting busier both night and day.

ELECTRONICS

The main conning position is state of the art, with every gauge, screen, alarm light, switch and control within ease of reach. *Te Kotuku* incorporates an impressive electronics package, the bulk of which has been supplied by Advance Trident Limited who have maintained a long-standing supply and service contract with Fullers for many years. With the new build, ATL was successful in winning the contract to supply the primary electronics to *Te Kotuku*.

The Radar is a JRC, model JMA-5212-4 10kw 4ft open array running into a 17in Navpixel display. For navigation there is a Simrad NSO chartplotter running into another 17in Navpixel display, providing full navigation, with a 16 channel high speed antenna for faster updates and GPS positioning. This is important given the high speed of the ferries. It will provide quick position updates of the ferry's position on the chart, and proximity to land mass and other vessels.

There is also a standalone AIS system providing full vessel data for collision avoidance – essential in the crowded waters of the Hauraki Gulf. The AIS will transmit the vessel's name, size, and call sign and will also alert other vessels fitted with AIS of *Te Kotuku's* course, speed and heading.

Also installed is a CCTV System, with eight cameras positioned throughout the vessel. This information will be fed through to various displays, providing crew with visual ▶

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One of two main saloon entrances



The main lower deck saloon



Looking forward in the main saloon



The lower main café

monitoring of the vessel, so they can see what is happening on each level of the boat.

The Intellian i2 satellite TV antenna will provide full satellite TV to the passengers as they travel from port to port, and this can be transmitted through the network of sixteen 42 inch LCD TVs spread throughout the vessel.

Naturally, there is a full public address and intercom system installed in the vessel providing full communication between Captain and engine room, aft decks etc, as well as the PA system for passenger announcements etc. As part of their commitment, ATL was involved in providing full working drawings of *Te Kotuku's* electronic systems.

Stepping out onto the top passenger deck, this is essentially an open deck with full overhead awning and side curtains for the first five metres. To port is the upper deck café and bar, and there is a mix of tables and quick-drying canvas-lined weatherproof seating.

Aft of the funnels is open air, with further seating and the main rescue deck where the four Ferryman 65 person MNZ-C reversible inflatable life-rafts are stowed.

Right aft is the man-overboard aluminum D tube 425R rescue boat fitted with a Yamaha 25hp outboard motor. The rescue boat is launched and retrieved by an Oceanlift LD500 hybrid davit.

In keeping with the larger vessel concept, egress below is via a double companionway set of stairs to the aft deck, with two double doors giving access in and out of the main saloon. For the main passenger boarding and departing, however, the gull-wing type ramps (which are similar to the ramps on the mid-size vessels in the Fullers fleet) also offer wheelchair access off the rear of the vessel.

The main saloon is expansive, maximizing the size of the vessel. There is a mix of tables and Beurteaux 200 series seating.

Positioned aft between the main doors is the large main café. Both cafés are of a new design so as to provide a user-friendly approach, and offering a greater range of food and hot and cold beverages.

The main cabins are fully air-conditioned using the new water-cooled Freeztec Marine air conditioning system. Gone are the rust-prone noisy evaporators from up on deck.

All the interior panel linings are new Ayres light-weight panels imported from Australia. Likewise the Dampa perforated tile ceiling system. Underfoot, Fullers have once again chosen the Lees Leading Lights coloured wrought iron broadloom synthetic carpet imported from the USA. Because the carpet carries a minimum 15 year lifetime warranty and may be water-blasted and wet vac'ed, it is becoming a company standard throughout Fullers' ferry fleet as the vessels are refurbished.

Deep in the hulls, tankage consists of twin 4000 litre fuel tanks, 3000 litres of fresh water and 3000 litres of sewage. Another feature: to get rid of that horrible smell associated with seawater flushing, the vessels heads are all freshwater flushing.

POWER

Another change is the introduction of Cummins marine diesel engines into the fleet. Fullers was mindful that some of their existing engine types were becoming obsolete. With this in mind, the company had already made the decision to introduce Yanmar engines for the smaller vessels from *Harbour Cat* up to the *Takahe*, and now Cummins power will be introduced into the larger vessels, as refits and re-powers permit.

These ferries do around 4000 hours a year, so require the use of heavy, commercially-rated engines. *Te Kotuku* is powered by twin Cummins QSK 38-M 1400bhp @1800rpm HD rating marine diesel engines. These are coupled to twin ZF5000 freestanding gearboxes.



Te Kotuku is greeted by the tug William C Daldy on her arrival to Auckland

The drive train has been developed by Henleys Propellers using the 'Easiflow' stern tube system and Thordon SXL bearings using 4 inch diameter AQ22 marine stainless steel shafts supported by 4 inch Nibral thru-hull 'P' struts, powering twin counter-rotating 44.5 x 49 inch Tiger design five-bladed propellers. Steering is via twin stainless steel spade rudders on 4 inch stainless steel rudder-stocks.

Sea trials resulted 28.9 knots at 99 percent load – meeting *Te Kotuku's* design spec straight out of the blocks, and giving her the specified service speed of 26 knots. To maintain this 26

knots service speed is vital when working scheduled passenger services, which is why these motors are top-of-the-range heavy-duty marine diesels. We note the rev range is lower, so these beasts will not be wringing their necks out day after day to keep up.

For onboard ship's power, twin 100kVA Cummins 6B-CP gensets are fitted – one in each engine room, to allow for redundancy or peak loads such as the anchor winch.

As already noted, *Te Kotuku* is designed to act as a back-up for the Devonport service where weather and sea conditions can

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make boarding and disembarkation difficult, the vessel is fitted with a Sidepower – SAC386 Twin counter rotating AC thruster fitted into the port hull bow. Manufactured in Norway by Sidepower and supplied by ATL, this thruster provides 520kg of thrust to better assist the vessel at this tricky Devonport wharf. The thruster has three stations: one at the main helm, and one at each wing station.

FIT AND FINISH

Prior to being painted in the Fullers corporate livery, *Te Kotuku* was fully abrasive-blasted with garnet blast media to provide the required anchor profile on the Aluminium substrate. Using International Paints, D R Marine spray painters fully coated the exterior with two coats of Intershield 300 (a high performance abrasion-resistant pure epoxy anticorrosive coating) to provide the optimum corrosion protection.

The exterior surfaces were then coated with YRA600, a premium polyurethane undercoat. The surfaces were fully sanded and then top coated with Fullers' corporate colours and International Devthane 4379 White.

The underwater hull system was coated using Intershield 300 and the new Intersleek 1100SR (slime release) advanced fluoropolymer foul-release coating for all types of vessels – with a designed in-service period of 60 months.

The high wear passenger decks and stair areas were primed with two coats of Intershield 300, incorporating a non-skid, slip-resistant particle. The decks were over-coated with Awlgrip 545, a thin film finishing primer for the hard wearing Awlgrip High gloss topcoat. This system has been used extensively on existing vessels in the Fullers fleet and has provided unparalleled performance as a hard wearing, easy-clean coating system requiring minimum maintenance.

The engine rooms and void space bilges were abrasive-blasted, coated with Intershield 300, YRA 600 and International Devthane 4379 white – providing excellent corrosion protection and chemical resistance to oil and fuel spills.


All interior and external lighting uses the new Hella Marine LED lighting systems.

Outwardly *Te Kotuku* is a smart-looking

ferry. At 35m, capable of 400 passengers, she is not small by anyone's standards. She has been designed for Auckland conditions, and the company has gone out of its way to try to meet their commuters' needs.

Every table has a USB port plus power for charging electronic devices. Fullers says they will be trialing onboard WiFi internet connection for passengers, but they may find that they are constrained by the service providers' ability to deliver. The goal is to be able to support 50 WiFi-connected devices at a time, which would be a major step forward. But at this stage, with limited water coverage the telecommunications companies can only provide flakey 3G service on the water over the Waiheke and Half Moon Bay routes. Fullers is fearful of over-promising and under-delivering through no fault of their own. Hence, the WiFi service will initially be on trial, and not guaranteed until the company is confident the Telcos can deliver more reliable and improved coverage.

While the build time was slightly longer than expected, and the delivery was delayed by weather, *Te Kotuku* bears testament to New Zealand ship building skills and her owner's firm commitment to our marine industry. She is now the most modern passenger ferry of her type to enter service – a ship which offers both commuters and tourists an improved standard of onboard services while maintaining a safe, comfortable journey among the inner islands of the Hauraki Gulf.

She is a vessel built for an anticipated 30 years service and we have no doubt about her prospects of fulfilling this vision. Today *Te Kotuku* can rightly take her place as the Queen of the fleet. 

SPECIFICATIONS	
LOA	34.09m
Beam	9.5m
Draft	1.9m
Construction	5083 Marine grade alloy plate
Power	Twin Cummins QSK 38-M 1400bhp @1800rpm
Service speed	26 knots
Fuel	8000lts
Builder	Q-west Boatbuilders Limited
Designer	InCat Crowther Design