Response: OIA2020.24

10 July 2020

To Brent Yardley

Via FYI.org – fyi-request-12143-867dafda@requests.fyi.org.nz

Dear Brent

Official information request for information on the new ferries

I refer to your official information request 4 June 2020, and copied below -

… with respect to the wake issue, how has it been determined that the new vessels will produce less wake than the current ships? Given that the new vessels are proposed to be twice the size this would appear to present a significant design challenge. It would also appear to be a significant risk to the project and the Marlborough Sounds environment if the ability to complete three return trips per day is in jeopardy. Are there plans to verify real-world wake generation from these vessels? is ISO 31000 being employed to manage risk in this regard? And can any documentation concerning this aspect of the vessel design and performance please be made available?

As you will be aware, the key component of the iRex project is to procure two new sister ships which will be bigger, cleaner and more efficient that the current three ferries, with modern propulsion technologies to improve manoeuvrability and reduce wake energies.

KiwiRail has commissioned the development of a concept design for inclusion as part of the recent closed tender for supply of the new ships. The concept design will be the reference for the shipyards designer to develop the actual design that will be built.

At the concept design stage, a number of functional/performance requirements are considered/verified in order to ensure that the actual design of the new ships could meet or exceed the set requirements.

The concept design includes the development of a hull form that, through a number of design iterations, is optimised for efficient speed & power, seakeeping, manoeuvrability. This includes the specification that ferries will be capable of three return voyages per day – assisted by terminal design development to enable 60-minute turnaround times.

In our case another key performance requirement for the hull design is to comply with the regulations on wave energy in the Marlborough Sound – Tory Channel and Queen Charlotte Sound as per the Marlborough Sounds Resource Management Plan.

The design brief included the following requirements in relation to wave energy in the Marlborough Sound:

- The new ships hull to be designed to meet the wave energy regulations in the Marlborough Sounds Resource Management Plan.
- The new ships hull to generate equal or less wave energy of the existing consented vessel Kaitaki in the Tory Channel and Queen Charlotte Sound.
- The wave energy to be calculated using one of the approved methods of calculation to demonstrate compliance with the above-mentioned regulations.
- The wave energy methodology to be reviewed and approved by the Marlborough District Council (MDC).
- The approved methodology to be complied with by the contracted shipyard to enable KiwiRail to apply for resources consent for the actual hull designed and built by the contracted shipyard.

The updated concept design, in relation to the wave energy compliance, was calculated by computational model that uses the RANS (Reynolds Average Navier Stokes) computational fluid dynamics (CFD). This is one of the calculation methods allowed by the Marlborough Sounds Resource Management Plan

The results showed that the concept hull would generate less wave energy of the consented vessel Kaitaki, with the optimisation of the principal dimensions of the concept vessel being length at waterline, draught and beam was the reason for the result – more efficient hull form than Kaitaki.

While the above point of a larger ship producing less wave energy than a smaller one (some 220 meters long compared to 180 meters) may be counter intuitive, it is possible by optimising the principle dimensions, which have been refined during the design process with the development of seven versions of the hull form.

The proposed methodology for calculating the wave energy on the new ships including additional validation methods to CFD calculation were reviewed and agreed with the MDC.

The methodology is included in the RFP technical documentation; however, these documents are currently withheld under Section 9 (2)(b)(ii) as the closed RFP process is underway. More information on the concept designs will be made available when possible.

We trust this answers your query; however, any further questions please get in touch.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or by calling free-phone 0800 802 602.

Yours sincerely

Dave Allard
Government Relations Advisor, KiwiRail