

KiwiRail Asset Management improvements

This summary includes background to Interislander's transition to improved asset management of its three ferries, including reports undertaken by international classification society and recognised advisor to the maritime industry, Den Norske Veritas (DNV).

The full reports undertaken by DNV are commercially sensitive, and comprehensive and detailed enough to make it impractical to prepare it for release. KiwiRail declines to release these under Sections 9(2)(i) and 18(f) of the Official Information Act.

This is because the reports provide a very detailed look (as summarised below) at each of the ferries, with the associated recommendations for maintenance, procurement of spare parts/upgraded systems, and enhanced purchasing and budgetary process for which we will be going out to market.

Under Section 16(1)(e), instead of providing the full reports, we are providing a summary of the reports and findings.

ASSET MANAGEMENT - INITIAL DIRECTION (FROM LATE 2021)

As part of a broader move to review and enhance asset management across KiwiRail, Interislander began reviewing its asset management strategies, practices, scopes and frequencies in late 2021.

This included:

- Developing a Strategic Asset Management Plan (SAMP) for the fleet and specific Asset Management Plans for each vessel, reflective of the age, condition and design of the vessels.
- Engagement of engineering consultants BECA to review Interislander's asset management systems. The resulting report helped to reshape Interislander's asset management development plan.
- Establishing a KiwiRail-wide Enterprise Asset Management Governance Team (EAMGT) to ensure that asset risks are being managed proactively at the highest level, and to ensure short-term maintenance is being undertaken in a timely fashion.

RESPONSE TO KAITAKI INCIDENT (FEBRUARY 2023)

When Kaitaki's loss of power occurred in late January 2023, asset management changes and improvements were already underway. The incident highlighted that while critical systems and equipment were part of the maintenance program, this did not extend to individual critical parts, such as the rubber connectors in the common cooling water system. The incident led to further immediate enhancements to Interislander's maintenance management, including:

- The rubber connector, which is one of the components in the common engine cooling system, was specifically added and identified in the preventative maintenance schedule;

- An additional approx. 10,000 parts and (sub-) components across the fleet were reviewed in terms of their criticality and potential failure modes. Maintenance scopes and schedules were adjusted accordingly.
- To ensure that all critical maintenance can be completed as scheduled, it was decided to reduce sailings across the fleet by 3% to create additional/longer maintenance windows.
- Improved governance reporting (and management) of critical maintenance up to KiwiRail's Executive Team and Board. This included weekly Technical Compliance reports (covering overdue work orders on critical and non-critical components, overall work order status, equipment failures, and any regulatory conditions on vessels) to the KiwiRail Chief Executive.
- Implementation of an enhanced risk management approach within Interislander – including multiple levels of review to ensure necessary preventative and corrective maintenance activities were undertaken on time.

KiwiRail subsequently commissioned DNV to independently review and assess the asset management capability and the vessels themselves.

DNV ASSESSMENT (MARCH 2023 – MAY 2024)

In March 2023, Interislander commissioned DNV to undertake a holistic assessment of the ships and maintenance practices. This was done in three phases:

Phase 1 - a targeted look across the three ships' systems to identify the criticality and level of redundancy of components in systems relating to propulsion, steering, cargo and mooring operations, electric power generation and distribution, navigation, heeling system, and fire main and fire detection systems.

- Using a Failure Modes Effects and Criticality Analysis (FMECA) approach 790 risk assessments were undertaken across 34 systems in each of the three vessels.
- It created a matrix of critical systems and their components, graded their level of risk and impacts against baselined international criteria. This provided a solid understanding of the risk profile of each vessel and was the foundation for Phase 2.

Phase 2 - an analysis of maintenance actions undertaken throughout the life of each ship, including reviewing the Interislander planned maintenance and procurement system (AMOS software) and analysis of its records and spare parts for the identified critical systems and equipment. From the combined results of Phases 1 and 2, Interislander technical managers were able to:

- Recommend configuration or design changes to ship systems (eg. adding additional pipes, valves or sensors to cooling systems) that could provide better early warning of technical issues, enhance system redundancy or provide the ability to better recover from a system outage. These changes will be implemented for each vessel at its next dry dock (Kaitaki – August 2024, Aratere – March 2025, and Kaiarahi – expected mid-2026).
- Review planned maintenance tasks and add new tasks into the asset maintenance system.
- Review spare parts inventories in each ship and in stores. In particular, we were able to identify where spares to support critical systems were missing and made improvements to inventory holding processes. This work is continuing.

Technical Advisory Group - To review recommendations from Phases 1 and 2, Interislander established a Technical Advisory Group (TAG). Over the last year the TAG has evolved from reviewing the DNV results to now reviewing asset performance, operational standards, technical advances, incident occurrence reports, and providing specialist advice and recommendations to the Interislander Executive General Manager and KiwiRail Chief Executive. The core standing members of the TAG comprises four senior maritime experts, within Interislander, with more than 100 years of combined marine experience from commercial, defence and asset backgrounds.

Interislander's safety function team also had a reporting line change so that it reports directly to the Interislander's EGM, to ensure any safety concerns are raised directly to the leadership level.

Phase 3 – was a review of Interislander's organisational asset management capabilities; configuration of AMOS (asset management software), shore-based functions, compliance reporting, wet and dry dock planning, inventory management, long term planning, and risk assessment. The recommendations of the report:

- Proposed changes to Interislander's organisational structure to create an appropriately qualified dedicated asset management team. The team has been established and their work is focused on asset planning, asset availability and providing assurance that maintenance is being carried out.
- Further recommendations, including establishing optimised performance and planning processes for major maintenance periods (wet and dry docks), centralising purchasing, and improved budget management process are being implemented to provide better control on quality, cost and outcomes of major maintenance periods and asset management for Interislander.

The DNV work validated and provided world-class benchmarking for the improvements Interislander had already been making and showed additional actions that could be undertaken.

DNV LIFE-EXTENSION (MARCH 2024 – JULY 2024)

Following the decision to cancel the Hyundai Mipo Dockyard contract in February 2024, DNV was commissioned to undertake an assessment of the actions needed to ensure the existing fleet continued to operate safely and reliably until 2029.

This included structural assessments of the three vessels as well as the condition of the hull areas and machinery systems.

Key findings:

- There are no systemic issues that will prevent the Interislander fleet safely and reliably operating until 2029, provided Interislander continues to follow regular on-going preventative and corrective maintenance, necessary upgrades and replacement of equipment, all relevant Class and Statutory surveys are carried out, and the vessel continues to hold valid certificates.
- DNV found the level of investment and maintenance regimes that Interislander has implemented over the life of the ferries has positively contributed to their condition.
- DNV also considered that the organisational changes being implemented at Interislander currently are better aligned with industry best practice in all facets, particularly technical vessel management.

- DNV notes that the likelihood of achieving the 2029 goal is dependent on the vessels and their systems maintaining their ongoing satisfactory condition, as is assumed in the report.

DNV’s assessments found:

- the hull condition of the fleet was “good” and the hulls had been well maintained. All three vessels have a low calculated hull fatigue age based on historic environmental data and operational cycles. At the end of 2029, each vessel will have a fatigue age between 7-11 years (<1/3 of their actual age) and no structural risks are anticipated. In Interislander’s view, this is extremely positive and helps reduce potential life-extension costs of the fleet. machinery in the vessels were assessed as “good to fair”. DNV commented that although the machinery had been well-maintained, many systems were old and increasingly obsolete – which means it is difficult to get parts for repair – and some system replacement would be needed to ensure reliability.

Hull fatigue life

To assess steel fatigue DNV used its proprietary *Nerves of Steel* software, looking at a vessel’s historic sailing routes and environmental data, to assess the stresses the ships were exposed to. The findings are:

	Actual ship age in 2029 (years)	Projected hull age in 2029 (years)
Aratere	31	10
Kaiarahi	31	6.9
Kaitaki	34	11.1

Interislander has a policy of not sailing in very heavy seas, to avoid discomfort to passengers and livestock. This has reduced each vessel’s exposure to extreme waves that could have accelerated hull fatigue.

Additionally, each ship has only been exposed to extreme loads less than 50% of their design limits, which also helps protect their structural integrity. This is due to the nature of the crossing between Picton and Wellington, where only about a third of it is in the open waters of Cook Strait.

Ship summary

Kaitaki:

- ‘Good to fair’ condition, in general.
- Some areas of corrosion in tanks and hull.
- A number of hull fatigue cracks in the superstructure. None have a significant impact on structural integrity of the ship.
- The corrosion and cracks will be addressed in the next dry dock, scheduled for August 2024.
- Some obsolescence of systems, particularly the bridge radar. An enhanced inspection regime is in place.

Kaiarahi:

- ‘Good to fair’ condition, in general.

- Some areas of corrosion in tanks and hull.
- A high number of machinery and systems assessed as in 'fair' condition.
- Higher number of systems facing obsolescence – including bridge systems, communications systems, and engine control and monitoring system.
- Engine control and monitoring system was upgraded in the June 2024 wet dock. An enhanced inspection regime is in place around the bridge and communications systems.

Aratere:

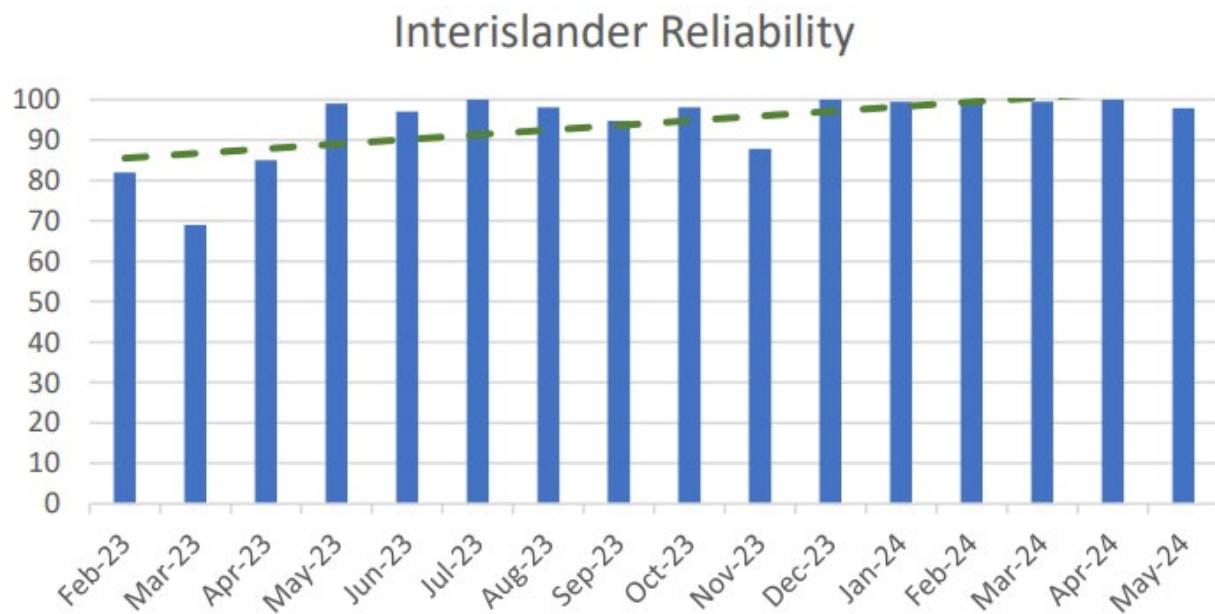
- 'Good' condition, in general.
- Some areas of corrosion in the secondary structure.
- Minor cracks in rail deck transition points. These have now been repaired.
- Some systems facing obsolescence - propulsion management, bridge and stabilizer systems.
- An enhanced inspection regime is in place for the bridge systems and is part of our obsolescence planning.

Evaluation criteria definitions:

- Good: fully functional with only normal maintenance required
- Fair: minor defect with minor additional maintenance required
- The rating scale used was from 1 to 5, corresponding to Good through to Unserviceable.

INTERISLANDER PERFORMANCE

Since early 2023, fleet service reliability has improved. Given that the vessels continue to age, this reflects the benefits of an enhanced maintenance approach.



Note: The drop in November 2023 was due to a few dozen Kaiarahi sailings being cancelled after the vessel collided with the wharf while berthing in Wellington. It was taken out of service for 11 days for hull repairs.