

Aratere Briefing

30 JUNE 2014

BACKGROUND THE INTERISLANDER FLEET

- Interislander operates three vessels – the *Arahura*, the *Kaitaki* and the *Aratere*.
- All three ships are roll-on roll-off and take rail freight, trucks and passengers.
- Together the *Arahura* and *Kaitaki* provide about 55% of our total capacity.
- The *Aratere* provides the remaining 45% of capacity and is the workhorse of the fleet, with more sailings than the other ferries.
- She makes six sailings a day between Wellington and Picton.
- Of these, three are freight-only and three carry passengers, their vehicles, trucks, and rail freight.

2011 ARATERE EXTENSION

- In 2011 major work was done to the *Aratere*, to increase her capacity and improve her performance to help meet the demands of the KiwiRail Turn Around Plan.
- The extension increased *Aratere*'s capacity by 30 per cent for rail freight, trucks, and cars.
- New propellers were fitted to give greater fuel efficiency (we've retrofitted propellers on our other ships too for the same reason).
- Two small engines were added for redundancy and fuel efficiency so she now has a total of six, and normally runs on only three or four.
- A new bow to improve her handling and performance.
- After the extension there was a major improvement in *Aratere*'s on-time performance – previously this had been a significant contributor to scheduling related disruptions.
- It also improved the ship's efficiency, improved fuel consumption and reduced wake energy by about 25 per cent.

PROPELLER FAILURE

- *Aratere*'s critical role in the fleet meant it was a huge concern when the tail section of her starboard propeller shaft broke.
 - There was no warning of the imminent failure.
 - *Aratere*'s control system monitors all machinery systems, including tail shaft bearing temperatures. None of those registered anything abnormal.
 - Our engineers, who are very familiar with the engine and motors didn't detect anything out of the ordinary.
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REPLACEMENT VESSEL

- The first priority was to organise *Aratere* for dry dock - options in Australia and Asia were considered and Singapore chosen.
- A replacement ferry was needed in a very short space of time while she was away – this was critical as it was peak season.
- There is a limited pool of roll-on-roll-off ferries available at short notice – particularly one that will fit our berths in Picton and Wellington.
- Interislander located the *Stena Alegria* in three weeks and had her operating in just over eight.

CAUSE OF FAILURE

- From the moment the failure happened and throughout the time in Singapore, the priority was to find the cause of the failure.
- A team of nationally and internationally recognised experts were hired, and included:
 - Lloyds Register
 - Quest Integrity
 - Stone Marine Shipcare
 - DNV
 - Matcor, and
 - Aurecon
- They looked at all the potential factors that could have led to the tail shaft failure and advised us how to avoid a repeat.
- The rudder stock cracks may also be related, however final reports on that are yet to be completed.
- From those expert opinions, and what was found when we took the gear apart in Singapore, there are a number of factors involved.
- As a result we are now reviewing our insurance, commercial and legal position.
- None of the factors relate to the lengthening of the ship.

REFURBISHMENT AND OVERHAUL

Aratere was due for her regular two year dry dock this year so that work was also done while she was in Singapore.

PROPELLER SHAFT

- The whole shaft has four sections.
- We replaced the broken tail section of the starboard shaft, the port tail shaft, and bearings on both sides.

PROPELLERS

- The original propellers were put back on because they had performed well for her first 13 years of service. Propellers have to be ordered and custom made – so commissioning a new set would have taken several months.

RUDDER STOCKS

- Rudder stocks connect the steering gear to the rudder - these shafts pass through the hull of the ship.
- A fracture was found in these so both stocks were replaced in a second spell in the dry dock. A full overhaul of the steering gear was also carried out.

MOTORS AND GEARBOXES

- The *Aratere* is a diesel electric vessel - her diesel engines generate electrical power which powers four electric motors. In turn they drive the propellers via the gearboxes.
 - The complete shafting system was realigned, including the motors and gearboxes.
 - The stabilisers and bow thrusters were overhauled.
 - Low friction silicon paint was put on the hull – will deliver fuel savings of about 4.5%.
 - All that work was carried out in the Keppel shipyard in Singapore.
 - Much of the critical work was done by the service reps of a number of leading global equipment manufacturers, including:
 - Rolls Royce Marine
 - ABB
 - Wartsila, and
 - DNVGL Consulting
 - Post the repairs we undertook exhaustive sea trials off the coast of Singapore – signed off by the entire management team of Kiwirail before she was allowed to leave.
 - Finally the *Aratere* required a safety certificate from a classification society before heading back.
 - Classification societies assess the physical condition of ships and the standards to which they've been built, and their sign-off is a mandatory insurance requirement.
 - For *Aratere*, we use Det Norske Veritas (DNV), one of the largest in the world, they have years of experience and are very well qualified.
 - They're there during all major maintenance and scheduled inspections and also inspect after incidents and repairs, and oversee sea trials.
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RECOMMISSIONING

- We are going to conduct further sea trials here in Wellington this week.
- DNV will certify *Aratere* again before she can resume a commercial ferry service.
- The sea trials will include manoeuvres to test all variations of speed, direction and the use of bow thrusters and stabilisers.
- Divers will also undertake an underwater inspection to check the propellers, shaft seals, rudders, stabilisers, thrusters and anodes are in good condition and properly secured.
- There are two specific tests we'll carry out to be sure the ship is fit for service.
- The leak down test is when the rudders are turned as far as they can do to their physical stops.
- Then you apply full hydraulic pressure for two minutes and see how much oil leaks. This tests all the newly replaced seals.
- If more than a certain amount of oil leaks, then the seals need to be inspected and adjusted or replaced.
- A crash stop measures the stopping distance of the ship - this tests ability of the electric drive systems to slow down, stop and go full speed astern.
- Again this test may mean the drive systems have to be adjusted too.
- We will repeat these tests several times and have the manufacturers' service teams in town for any fine tuning that's needed.
- Apart from the classification society, Maritime New Zealand must also check the ship and its crew are safe to resume service.
- They look at all Interislander's safety management systems and processes to check we can operate the ship in a safe manner.
- Both DNV and MNZ surveyors will be on board in the first week carrying out their inspections.
- The *Aratere* will not sail until we're satisfied the reconditioning programme has again been signed off by every member of the KiwiRail management team.
- The sea trials will mostly take place in the harbour over this week but also some out in the Strait.
- She will be berthed at Aotea Quay or the terminal, and also at anchor because she has to share her berth with the *Arahura*.
- Finally there will be a new level of ongoing monitoring.
- During the sea trials in Singapore we logged extensive baseline data on the tail shafts vibrations, and will be carefully monitoring all shaft vibrations against that data from now on.

RETURN TO SERVICE

The re-commissioning of the *Aratere* involves a number of other activities.

- Unloading equipment taken to and returned from Singapore.
- Re-load all the *Aratere*'s on-board equipment used on the *Stena Alega* - from seating to restocking the shops to IT gear.

For the first week of service from July 7 this will be mainly freight sailings and on a reduced timetable so we can properly re-establish systems, processes and routines.

- There will be a limited number of passengers such as truck drivers.
- This week capacity to manage freight demand will be tighter than normal because the *Stena Alega* finished service on Saturday.
- We are working with our customers to manage their requirements as best we can.
- Passenger services are not affected.
- All new passenger bookings can be fully accommodated on the *Kaitaki* and *Arahura*.

CONCLUSION

- Over the last six months, we've conducted a thorough independent investigation with national and international maritime experts.
- What they found out has guided the repairs we've had done on the ship.
- Major equipment manufacturers have been there for all the critical work including Rolls Royce Marine, ABB, Wartsila and DNVGL Consulting.
- Extensive sea trials were conducted and all the repairs were signed off by the classification society.
- Maritime New Zealand, the Classification Society and the team at Interislander and KiwiRail must all be satisfied *Aratere* is safe to resume commercial service.
- It's been an intensive process involving global experts and a quality management approach.
- That approach will continue so we can again deliver the reliable service our customers expect and which we've delivered in the past.
- Interislander is an iconic brand with a strong heritage.
- Market research as recently as April shows that 70% of respondents trusted Interislander.
- That exceeds many other transport providers and is close to Air New Zealand's levels.
- KiwiRail and Interislander are determined to maintain that trust.