



A new Thordon TG100 emergency shaft seal on the Jennifer S.

THORDON EMERGENCY SEAL PREVENTS **ANOTHER** WORKBOAT FROM SINKING

The safe-return-to-port function of Thordon Bearings' TG100 emergency shaft seal has once again prevented a vessel from sinking following a catastrophic shaft failure.

The crew of the MM Transportation-operated *Jennifer S*, a 17m (56ft) long workboat operating on the Ohio River, near Rockport, Indiana, activated Thordon's secondary inflatable emergency seal when the tailshaft was pulled out of the coupling damaging the TG100's primary aft shaft seal.

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THORDON EMERGENCY SEAL PREVENTS **ANOTHER** WORKBOAT FROM SINKING ...CONTINUED



On the evening of February 3rd 2020, the *Jennifer S* was towing a dredge when the starboard shaft line became entwined with a buoy's wire rope, forcing the shaft from the hub at the gearbox. This, in turn, resulted in the aft shaft nut at the wheel hitting the rudder when in the full ahead position causing the shaft to slide even further aft.

Jason Perry, Thordon's Regional Manager – North America, said: "When steering became stiff, the crew went down to the engine room and noticed water gushing in up to the deck plates. They immediately activated the TG100's emergency seal, which prevented further water ingress."

When the vessel was inspected, port engineers found that the shaft had come loose from the coupling, slamming into the entire rotating assembly and damaging the TG100 seal's silicon carbide faces, which in turn cut a 25.4mm (1 in) split all around the bellows. "Had this vessel not been fitted with Thordon's emergency seal technology, the vessel was likely to have sunk," said Perry.

Scott Groves, Thordon Bearings' VP Sales, furthered that the emergency function helped keep the seal's taper lock (wedge ring) in position on the shaft, preventing the vessel's shaft from completely sliding out of the vessel.

"We are extremely confident that no other shaft seal currently available is able to prevent complete seal failure in such a scenario. I have my doubts as to whether a conventional seal would have responded as well as the TG100 in such circumstances. Certainly, standard clamp rings with a set screw would have been unable to hold position when the shaft seal was so heavily damaged," he said.

Thordon's tapered lock/wedge ring tightens to the shaft under forward forces to maintain compression of the bellows on the shaft, even if the entire assembly is damaged or the tailshaft retracts.

"Everyone onboard was safe, dry, and went home to their families that night," said Perry.

Thordon's US Inland Waterways team arrived at the port and a new TG100 seal was installed on February 6th 2020.

“ WE ARE EXTREMELY CONFIDENT THAT NO OTHER SHAFT SEAL CURRENTLY AVAILABLE IS ABLE TO PREVENT COMPLETE SEAL FAILURE IN SUCH A SCENARIO. I HAVE MY DOUBTS AS TO WHETHER A CONVENTIONAL SEAL WOULD HAVE RESPONDED AS WELL AS THE TG100 IN SUCH CIRCUMSTANCES. ”

Jeff Hall, Drydocking Manager, MM Transportation, said: "We received excellent service from Thordon who helped reinstall a new TG100 seal and replaced the silicon carbide faces on the port seal, which were also damaged when the shaft came loose. We have the seals on two other workboats and will definitely be installing the same system on others. The TG100 seal saved our boat."

A similar incident occurred in 2019 when the crew of a 2002-built twin-screw workboat activated the

TG100's secondary seal after suffering catastrophic shaft failure in the Mississippi River north of New Orleans. This vessel was the very first workboat to be fitted with a TG100 seal, in 2011.

Commenting on the success of the TG100 seal, Craig Carter, Director of Marketing & Customer Service, said: "The TG100 has an excellent performance record with hundreds of units now in service. It really is an important component to vessel safety, protecting not only the lives of the crew but also the vessel."



This TG100 seal prevented the vessel from sinking

THORDON DEFIES THE LAWS OF PHYSICS WITH **COST-SAVING RETROFIT SOLUTION**

Excessive bearing and shaft wear resulting in frequent drydockings has led a Louisiana-based workboat operator to improve operational competitiveness and ensure greater equipment usability by converting to a Thordon RiverTough tailshaft system.

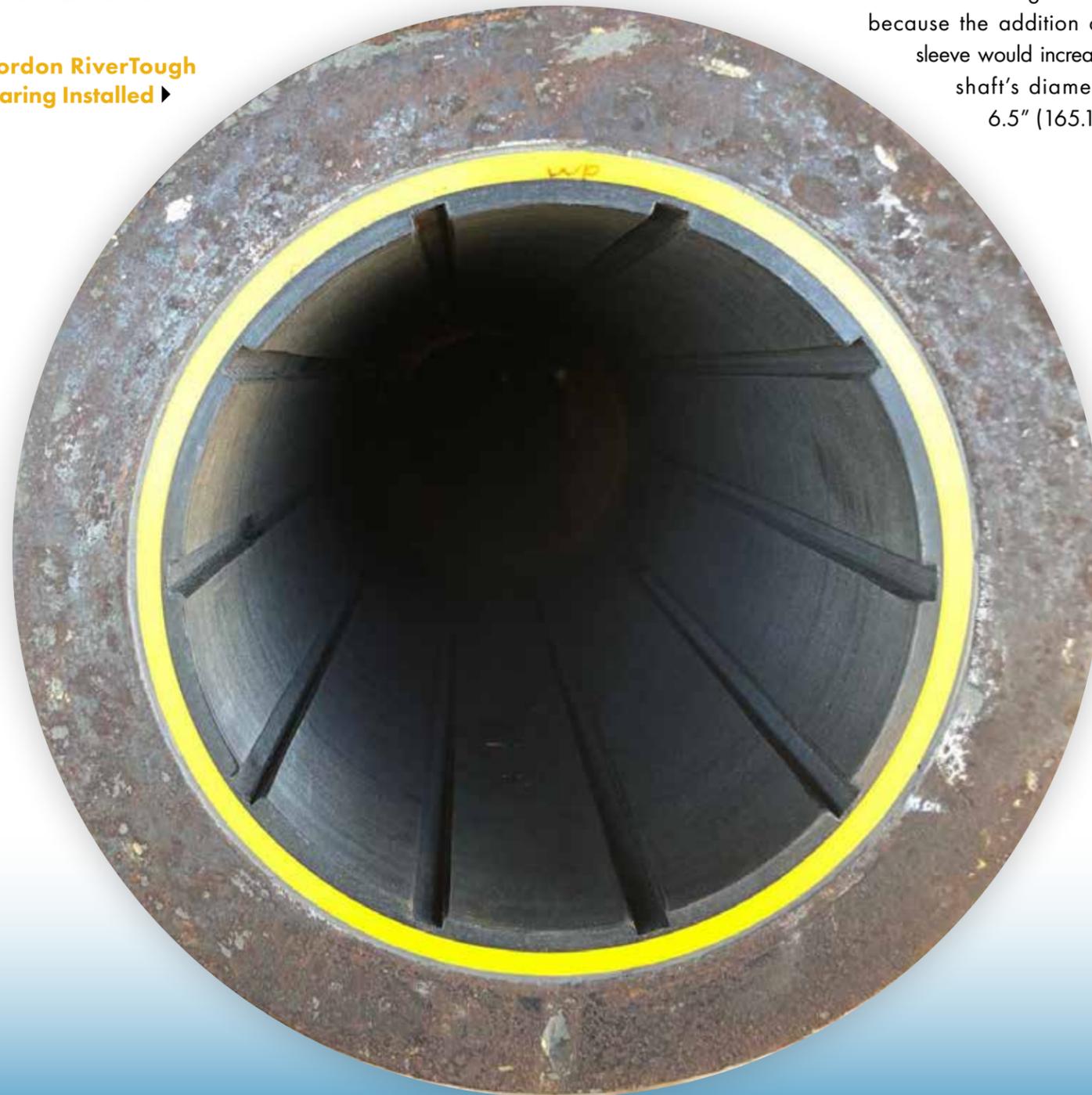
While Thordon Bearings is unable to disclose the name of the operator, Thordon performed a RiverTough bearing conversion to a twin-screw towboat running on the lower Mississippi with 6" (152.4mm) Aquamet diameter shafts and 6" rubber bearings.

Thordon sales manager Jim Bright said: "The increased tailshaft maintenance costs combined with lost charter days as the vessel required drydocking before its normal docking schedule led this particular operator to ask Thordon for recommendations on how best to reduce life cycle costs."

"We are finding a lot of towboat owners, running rubber strut bearings directly on stainless steel or Aquamet shafts, are experiencing excessive shaft and bearing wear resulting in drydockings every 18 months or so, at significant cost."

To improve performance, the rubber tailshaft bearings could be replaced by Thordon's RiverTough which would solve one issue but Bright pointed out this would only address half the problem, "the shafts would continue to wear as before."

Thordon RiverTough Bearing Installed ▶



To solve this problem and mitigate against the abrasive effects of the Mississippi River, it was decided that a Hardened non-corrosive NCB ThorSleeve would be fit over the shafts. With the addition of ThorSleeves, the shaft would be able to deliver longer life to match the RiverTough Bearings' performance. However, this was not so straightforward because the addition of the sleeve would increase the shaft's diameter to 6.5" (165.1mm).

"To accommodate the larger shaft diameter a larger bearing had to be installed," said Bright. "But fitting a larger bearing into a strut designed for a 6" (152.4mm) bearing would require a considerable amount of line boring and modification work or the need to completely replace the strut, which in the past was the only way to undertake this kind of project."

"Both of these options come with a high price tag making the upgrade hard to justify, so rather than modifying the struts, we found an alternative solution that cheated the laws of physics."

Thordon's engineering team designed a bearing that could accommodate the larger shaft while fitting into the original housing, without impacting the bearing performance or its abrasive resistance qualities.

"In effect we fitted a bearing designed to go in a housing for a 6.5" (165.1mm) shaft into a housing designed for a 6" (152.4mm) shaft. The solution saved approximately US\$10,000 in line boring and machining work, while also giving the workboat operator a tailshaft bearing system capable of lasting for years rather than months."

According to Jason Perry, Thordon Bearings' Regional Manager – North America, the project was completed at the dockyard of Ashton Marine LLC in Harvey, Louisiana and Thordon also carried out the same process on a second vessel in the operator's eight-strong fleet.

"We will begin stocking this custom-sized bearing in their Gulf Coast Warehouse and are reviewing several other sizes to offer owners operating other size shafts," he said. "Cost effective solutions are a trademark for Thordon Bearings. We take the 'work' out of workboat." ◉



THORDON'S TAILSHAFT BEARING AND SEAL COMBO PROVING TO **SAVE** **VESSEL OWNERS** **MONEY IN MORE** **WAYS THAN ONE**



During a recent drydocking, the final vessel in a series of five ship-assist tugs was successfully converted to RiverTough tailshaft bearings and Thordon's TG100 shaft seals and returned to work on the Mississippi River.

These five tugs are considered to be the first ship-assist tugs operating in the lower Mississippi fitted with both RiverTough bearings and TG100 seals.

The New-Orleans-based tug operator converted its first vessel – a 117ft (35m), 4200hp twin-screw ship-assist tug in 2015 – in order to reduce the operating and maintenance costs associated with traditional rubber tailshaft bearings and clad welded journals.

According to Thordon Bearings' Sales Manager, Jim Bright, who was involved in all five retrofits, the owner specified the solution because they were tired of unbudgeted costs following frequent premature bearing and shaft wear. The owners were familiar with the reputation of RiverTough bearings and their excellent performance on other workboats.

"Their previous arrangements of rubber bearings had to be replaced every two years or so and the shafts needed to be repaired due to excessive wear. This can be avoided with Thordon's products," said Bright.

When RiverTough bearings are used by workboats, they routinely provide wear rates of 0.003" to 0.004" (0.075mm to 0.100mm) in 6000 to 7000 hours of annual use on the Mississippi River.

This upgrade was the first ship-assist tug in the New Orleans Port to change over to Thordon. "We proposed retrofitting the RiverTough tailshaft bearing in conjunction with a ThorSleeve hardened shaft sleeve, and a TG100 shaft seal. This is a much more suitable shafting solution for vessels operating in abrasive rivers like the Mississippi," Bright stated.

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”

However, during discussions with the owner it emerged that a different installation method was required. The traditional approach of casting Chockfast® (an epoxy resin) directly to the outside diameter of the bearing meant that the Chockfast resin had to be chiseled out each time the existing rubber bearing needed replacing. A new rubber bearing would have to be installed every 18-24 months. The bearing would have to be aligned and new Chockfast cast around them. This added to the time that the vessel was docked for repairs which in turn meant additional costs. When you factor the lost charter work into the equation, this process can be very costly for the ship owner.

Thordon's solution created a permanent housing using the Chockfast epoxy grout. Thordon worked with the shipyard to manufacture a mandrel (a dummy plug) to replicate the outside diameter of the bearing. This was coated with a release agent to prevent the Chockfast from sticking to the bearing. The plug was laser aligned in the strut and then Chockfast was poured around the mandrel. Once it was cured the plug was removed, leaving a perfect housing for the RiverTough bearing. The bearings were then installed in the new Chockfast housing by shrink fitting it with liquid nitrogen.

"This method of installation creates a permanent bearing housing that can be reused with a replacement bearing should it be needed, without the cost of installing new Chockfast," said Bright.

The same technique was used on the rest of the vessels in the series.

Bright continued: "These workhorses are now fitted with a technology that routinely outlasts rubber bearings by a factor of two or more. The RiverTough and TG100 solution supplied to this operator reduced installation time and costs, while providing a more simplified process that doesn't require chipping out and replacing hard-to-remove grout."

The first tug has been operating with RiverTough bearings and TG100 shaft seals since November 2015 and has gone through at least one docking cycle without having to replace the bearings.

"For this owner, RiverTough has paid for itself and will continue to pay dividends for many years to come," Bright added.

Thordon Bearings completed the conversion of the fifth and final vessel in the series for the owner in April 2020 and carried out a similar project for a US-based operator of 10,000bbl clean /chemical barges. ○

PARANÁ RIVER PUSH BOAT FLEET MIGRATES TO THORDON



Atria Logistics UABL, one of South America's leading push boat operators, is on its way to completing a fleet-wide retrofit to Thordon's water lubricated tailshaft and rudder bearings.

In 2014, the Argentinian owner, which operates a fleet of workboats on the Paraná River, installed Thordon's RiverTough tailshaft bearings to its first push boat, the 41m (135ft) long *Concepcion*. In 2020, six more vessels in the company's 26-strong fleet were converted.

Egnard Bernal, Thordon Bearing's Business Development Manager, Marine, LATAM said: "Atria Logistics' decision to continue the conversion process is based on the success of its first installation back in 2014.

"When *Concepcion* was inspected in 2020, the RiverTough bearings were still in good condition and considered operational for at least five more years of service. We have now completed a number of retrofit installations to vessels in the Atria fleet."

Taking advantage of the dry season and the lower river traffic, Atria drydocked *Cavalier IV*, *Cavalier X*, *Cavalier XII*, *Titan*, *Pluton* and *San Martin* at the Atria-owned Pueblo Esther Shipyard, in Santa Fe, Argentina.

Other vessels that have been retrofitted with Thordon include *Misiones*, *Zonda*, *Chaco X*, *Pluton*, *Urano*, *Saturno*, *Neptuno*, *Santa Maria* and *Titan*.

When *Cavalier X* was retrofitted with ThorPlas-Blue linkage and jockey arm bearings, Atria Logistics' noticed a significant improvement in operations, said Bernal. "Without even asking, they said 'it is a relief to have them. The [bearings] don't have to be greased anymore and operation is very smooth'. Even the Captain asked what we did to reduce vibration and friction. They are delighted."

During the drydocking period, Marine Logistics, Thordon Bearings' Buenos Aires-based distributor supplied, installed and commissioned the vessels' RiverTough tailshaft bearings along with Thordon's

SXL grease-free rudder bearings. These vessels previously had stainless steel rudder shafts with greased rubber or bronze bearings.

"The Atria push boats vary in power between 7,200hp and 8,200hp, with tailshaft diameters varying between 200mm (7.87in) and 305mm (12in). The fact that the Thordon products can be machined to suit non-standard housings is a further advantage over the other competitive bearings," said Bernal.

Marine Logistics' Hernan Lopez added: "RiverTough bearings can help deal with misalignment. Some of the rubber bearings had up to 10mm (0.4in) clearance, which led to unacceptable levels of vibration."

Lopez continued: "The longer life and reduced clearance of the Thordon products plus zero pollution were a few of the key Thordon benefits. Although the main benefit for our customer is the robustness of the bearing material and Thordon's level of service."

Atria operates a fleet of push boats on the Paraná River, a waterway that is characterized by its abrasive nature, resulting in high wear rates for conventional rubber tailshaft bearings.

At about 4880km (3032 miles) in length, the river is second only in length to the Amazon among South American rivers, rising in Brazil and for much of its navigable length forming a natural border between Paraguay and Argentina. It joins with the Uruguay River to form the Río de la Plata (River Plate) reaching the South Atlantic Ocean via the River Plate delta near Buenos Aires. The river is a vital transport link, used by sea-going crafts as well as river push boats and barges, linking the major cities of Argentina and Paraguay.

"Atria's largest push boats can handle up to 42 barges on some stretches of the river, equivalent to a load capacity of more than 1900 trucks," said Lopez. "The change from rubber tailshaft bearings to the Thordon system means that the company's vessels can remain working for longer periods without drydocking. With Thordon and Marine Logistics, Atria now has a 'one-stop shop' solution for all of its bearing requirements."

According to Lopez, Atria intends to continue the bearing replacement program with SXL rudder bearings and thrust washers, Thordon Pucker Seals, and RiverTough propeller shaft bearings. They are also considering Thordon's award-winning TG100 shaft seal.

“THE LONGER LIFE AND REDUCED CLEARANCE OF THE THORDON PRODUCTS PLUS ZERO POLLUTION WERE A FEW OF THE KEY THORDON BENEFITS. ALTHOUGH THE MAIN BENEFIT FOR OUR CUSTOMER IS THE ROBUSTNESS OF THE BEARING MATERIAL AND THORDON'S LEVEL OF SERVICE.”

GRUPO SERVICIOS MARITIMOS **RESOLVED** THEIR FREQUENT TAILSHAFT BEARING HEADACHES BY OPTING FOR **THORDON**

Grupo Servicios Maritimos, an Argentinian company offering a variety of services related to the maritime, inland waterways and port activity, operate a fleet of ten tugs, two container feeders and six pilot/service launches, as well as a number of barges.

A frequent headache for the Buenos Aires-based operator was the excessive tailshaft bearing wear rates experienced on some vessels operating conventional rubber bearings in a mix of sea-, brackish-, muddy-, and freshwaters.

The company looked for an alternative solution, and in October 2020, contacted Thordon's authorized distributor in Argentina, Marine Logistics SA, with a request to install Thordon's robust, low maintenance water-lubricated RiverTough tailshaft bearings to the 1975-built *Candela S*.

The Tandamor Shipyard in Buenos Aires, completed the work to the 44.7m (147ft), 543gt push boat in December 2020.

Hernan Lopez of Marine Logistics, recalled: "Being an old boat, this did not appear to be a simple installation. The 303mm (12in) diameter tailshaft and rubber bearing were both showing considerable wear, along with excessive bearing clearances. Another problem was that the shaft liner was a different diameter from that shown on the drawings.

"Fortunately, Thordon materials can be easily machined to adapt to multiple shaft and housing sizes, whereas conventional materials would encounter difficulties when faced with this issue. The RiverTough tailshaft bearings were installed successfully – and quickly!"

Impressed by the attention to detail shown by Marine Logistics and Egnard Bernal, Thordon's Business Development Manager for Latin America, Grupo Servicios Maritimos decided to include Thordon SXL rudder bearings and Thordon Pucker Seals on the purchase order.

"The owner will save money in the long run because the Thordon material can be machined to suit multiple shaft diameter sizes," said Bernal. "This makes ordering and the installation much simpler. Additionally, the long life cycle of the Thordon material reduces the need for frequent drydockings for bearing and seal replacement, which reduces the operating costs considerably for the vessel owner."

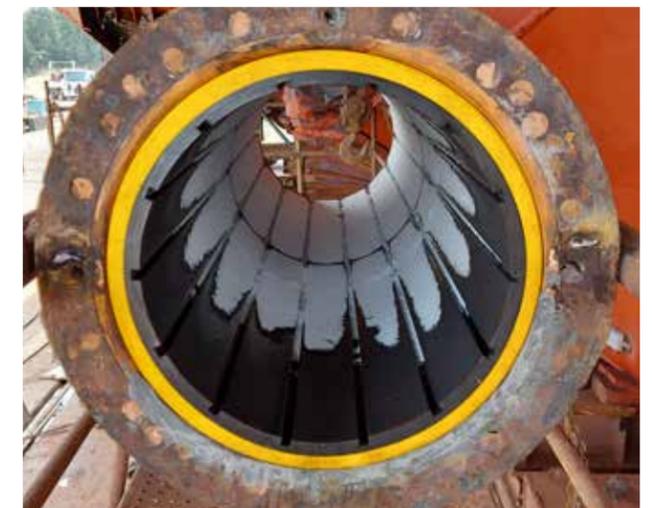
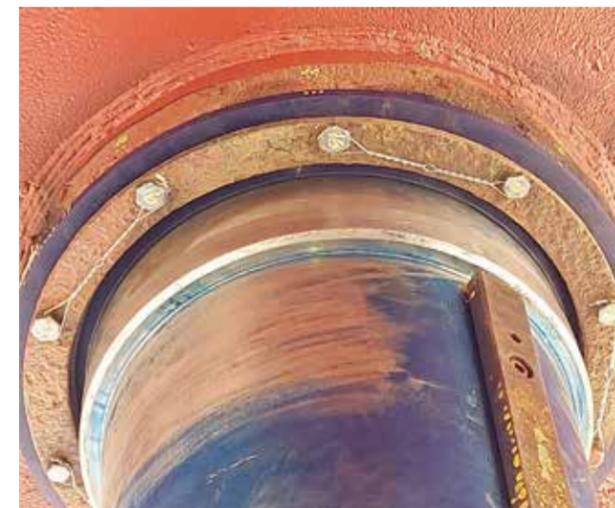
RiverTough tailshaft bearings, run in combination with hard coated nickel-chrome-boron (NCB) shaft sleeves, routinely outlast rubber bearings by a factor of two or more in the abrasive water conditions encountered on South American waterways.

"The elastomeric polymer material pioneered by Thordon offers increased resilience compared to rubber bearings, resulting in easier alignment and less edge loading," he said. "For repair applications where the housing bore condition may be less than ideal, water lubricated RiverTough bearings can be bonded in place using an approved adhesive."

Thordon SXL rudder bearings, meanwhile, operate without grease, above and below the waterline. SXL offers high abrasion resistance and can also withstand high shock loads, improving the wear life of the bearing.

Similarly, the Thordon Pucker Seal is manufactured from a tough self-lubricating polymer, designed to keep out abrasives such as sand and grit from the rudder trunk.

"Thordon's reputation for in-service performance, reliability and good service is well known throughout the region, which is likely to lead to requests for more Thordon products in their fleet," said Lopez. 



THE SUCCESS OF THORDON'S RIVERTOUGH SPURS FLEET-WIDE CONVERSION FOR HARKEN TOWING

Harken Towing, a western Canada-based workboat company with operations along the Fraser River, is converting its vessels' tailshaft bearings to RiverTough following the success of the Thordon bearing system aboard the 14.54m (47.7ft) twin-screw tug *Granny Hutch*.

Since the first installation in 2015, Harken Towing, which operates a fleet of ten shift tugs, five continuous tugs and nine aluminum water taxis, has installed RiverTough to an additional three tugs and plans to convert the remaining vessels at subsequent drydockings.

Sandy Bourquin, Marine Account Executive at Palmer Johnson Power Systems, Thordon Bearings' distributor in British Columbia, said the installation has significantly reduced the company's operating costs.

"Many tug owners operating in highly abrasive, silty waterways, such as the Fraser River, find that traditional rubber bearings need to be replaced every two years. This means that vessels have to be routinely taken out of service and have their shafts withdrawn, which is a very costly exercise. RiverTough bearings are saving operators a lot of unnecessary expenditure as it is lasting over 2 times the life of rubber bearings!"

The 152.4mm (6in) polymer bearings installed to *Granny Hutch* five years ago have not been replaced and remain in almost perfect condition.

Harken Towing engineer Shawn Davies said: "We checked wear and clearances during a recent drydocking and found the bearings to be in excellent condition. RiverTough has proven itself. The whole system and all the components are in perfect working condition."

Since that first installation, Harken Towing has converted from rubber bearings to RiverTough tailshaft bearings on *Ken Mackenzie* and *Harken 6*.

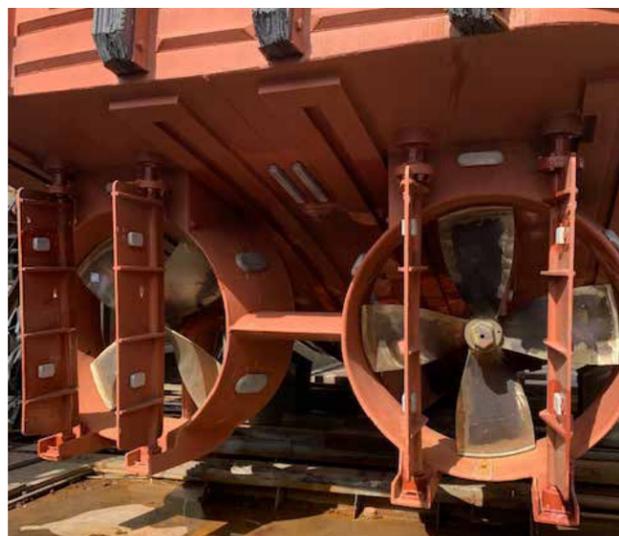


Scott Groves, Thordon Bearings' VP Sales, said: "While there are five companies operating Thordon's RiverTough along the Fraser River, this is the first clearance data we have received for a vessel operating on this waterway. The feedback from Harken Towing provides clear evidence of RiverTough's superior wear life in very abrasive water conditions. They routinely outlast rubber bearings by factor of two or more."

Data from workboats operating on the Mississippi River system show typical RiverTough wear rates of 0.075mm to 0.100mm (0.0029in to 0.0039in) in 6000 to 7000 hours of annual use.

Harken Towing plans to install RiverTough to its remaining vessels over the course of the next few years.

Founded in 1948, Harken Towing is one of the most prominent marine towing services companies on Canada's West Coast. The company's main focus is towing log booms and barges in the rivers and Coast of the Pacific Northwest. 



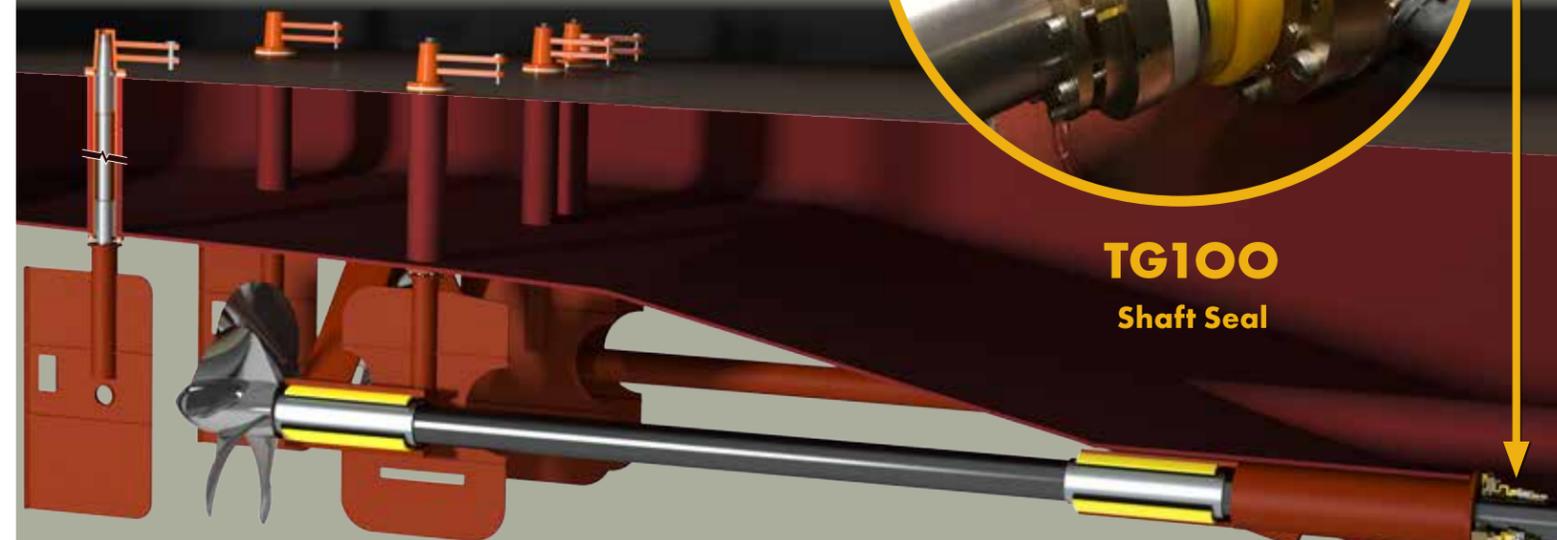
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- No wear on the shaft or liner
- No spare parts required



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L&L MARINE ACCEPTS DELIVERY OF ITS FIRST NEWBUILD WITH A COMPLETE THORDON PROPULSION PACKAGE



Amelia Ray, the 1600hp towboat Rodriguez Shipbuilding delivered to Mississippi operator L&L Marine Transportation in June 2020, is now operational with a full range of Thordon oil-free and grease-free bearings designed to reduce a vessel's lost charter days.

The 65ft (20m) newbuild is the first vessel in the L&L Marine fleet to be specified with a Thordon propulsion package at the vessel design stage.

The decision to select the polymer pioneer's RiverTough tailshaft bearings, shaft liners, TG100 seals, ThorPlas-Blue rudder bearings, ThorPlas-Blue Self Aligning Bearings (SAB's) in the steering gear, and SXL thrust washers for the newbuild follows the success of earlier retrofits across the owner's fleet.

L&L Marine owner Lee LeBoeuf explained that all his vessels now operate with only Thordon bearings due to the "significant operational savings" experienced with the earlier installations. The Harvey, Louisiana-based operator owns a fleet of five vessels.

"We initially replaced all our rubber tailshaft bearings with Thordon's RiverTough bearings and shaft liners and found we were able to extend drydocking intervals from three to eight years.

"We then started retrofitting ThorPlas-Blue bearings in the rudder stocks and installing TG100 seals, which reduced operational costs even further as there is less vessel down time and maintenance. This means we are more attractive to our customers, more dependable, and more reliable. We can better plan drydock schedules in line with the operational needs of our customers," said LeBoeuf.

Thordon Sales Manager Jim Bright said: "L&L Marine, a longtime customer for Thordon Bearings, has a small fleet of workboats which means that the financial risks are higher if a vessel has to come out of service for repair work. Lee tells me that the switch to Thordon bearings and seals has not only mitigated these risks but helped facilitate improvements to the bottom line."

Bright flagged up the performance of the Self Aligning Bearings, in particular. "The tiller arms of the steering system on this new vessel were also fitted with Thordon's Self Aligning Bearings on both the live end of the steering cylinder and the jockey bar. The SAB, made from ThorPlas-Blue polymer material, is not only self-aligning, but it also provides grease-free operation. This allows the tillers to operate with independent suspension. As the rudder works there is no binding of the jockey bar which would typically result in increased stress and wear on the bushings, resulting in reduced maintenance and associated costs."

LeBoeuf attests that while capital expenditure is more than a conventional tailshaft/propulsion bearing system, the Thordon application aboard *Amelia Ray* is expected to result in annual operational savings of US\$15,000.

"Compared to conventional propulsion and tailshaft bearings, which require regular maintenance, replacement and frequent drydocking, the Thordon system results in a threefold reduction in operational costs," said LeBoeuf.

Designed by Entech, *Amelia Ray* is a twin-screw towboat purpose-built for the transportation of petrochemicals along all inland and coastal waters in the southern states of the US.

Powered by a pair of Mitsubishi S6R2 diesel engines driving Kahlenberg screws through Twin Disc MGX5321 reduction gears. Two 60kW Cummins generators provide power to, amongst other consumers, a Hydra Force electric-over-hydraulic steering system.

With tank capacity to transport 15,000gl (68.1m³) of petrochemicals, 4,100gl (18.6m³) of potable water, 500gl (1.9m³) of lube oil and 400gl (1.5m³) of dirty oil, L&L Marine's new boat is Subchapter M compliant and therefore able move barges carrying oil or hazardous materials in no discharge areas from St. Marks, Florida to Rio Grande, Texas on the Intracoastal Waterway and rivers not more than three miles from shore.

Set to work without the benefit of a full-fledged christening due to the Coronavirus crisis, *Amelia Ray*, named after the owner's four-year-old granddaughter, is currently running petrochemical products along the Mississippi between Houston, Texas and Baton Rouge, Louisiana.

L&L Marine has an option on an additional vessel from of Bayou la Batre-based Rodriguez Shipbuilding but "we will wait to see how COVID-19 plays out before making the decision," said LeBoeuf.

“WE INITIALLY REPLACED ALL OUR RUBBER TAILSHAFT BEARINGS WITH THORDON'S RIVERTOUGH BEARINGS AND SHAFT LINERS AND FOUND WE WERE ABLE TO EXTEND DRYDOCKING INTERVALS FROM 3 TO 8 YEARS.”



THORDON SEAL RETROFIT KEEPS *HADI 37* ON-HIRE



Capital expenditure is always a key consideration during the system procurement process but when low-cost components result in an increase in unbudgeted operational costs, then any savings quickly diminish.

That was the experience of Saudi Arabia-based ship operator Hadi Hamad Al-Hammam when the original shaft seals fitted to *Hadi 37*, a 2013-built twin-screw offshore tug supply vessel (OTSV), began to leak and vibrate, resulting in regular visits to drydock for costly repairs.

“Reducing the maintenance spend associated with the original seal installation was the driving factor behind the decision to retrofit Thordon Bearings’ TG100 seals,” said Rafid Qureshi, Managing Director, Ocean Power International LLC, the Dubai-based engineering and technical services company and authorized Thordon distributor.

“The vessel’s existing arrangement did not perform as expected and for a vessel under charter to Saudi Arabian oil major Aramco, finding a system capable of reducing off-hire time was crucial. The company approached us to source a more cost-effective solution,” explained Qureshi.

“Hadi Hamad preferred the maintenance-free seal over other known brands. The costs of pulling a shaft and replacing a seal every 2.5 - 3 years, can go upwards of USD \$35,000 – \$50,000 over the life of a vessel which is well above the acquisition cost of a maintenance free alternative,” said Qureshi.

“The owner already had experience with Thordon products aboard the 200m long OTSV – water lubricated XL propeller shaft and SXL rudder bearings fitted in 2013 as newbuild installations – so retrofitting the TG100 was an easy decision to make. We installed and commissioned a pair of 165mm (6.5in) diameter seals at the Dubai Maritime City (DMC) drydock, in 2016.”



George Morrison, Thordon Bearings’ Regional Manager – AMEA & ANZ, said: “Competitor manufacturers often offer of a low capital product, hoping to recuperate costs with aftersales in a repair and maintenance market where replacement parts and components can be expensive. We tend not to focus on this market – an approach that reflects in the reliability and quality of our products.”

During *Hadi 37*’s most recent classification survey, Hadi Hamad Al-Hammam, which operates a fleet of over 40 vessels, found the seals to be in “excellent working order”.

Khalid Zahran, Engineering Manager for Hadi Hamad, said: “We recently inspected the seals in drydock and they were in perfect condition. We are highly satisfied with their performance.”

Since the installation, Ocean Power International says it has witnessed increased interest for Thordon’s bearings and seals for installation to newbuild projects.

“They say bad news spreads like wildfire, but so too does good news,” said Qureshi. “By word of mouth, there is a lot of interest in the region for Thordon products.”

The TG100 is a mechanical seal specially developed for 86mm (3.375in) to 305mm (12in) water lubricated propeller shafts typical of workboats, dredgers, tugs, yachts, patrol crafts and other coastal vessels operating in either clean or dirty, abrasive waters.

The primary seal uses hard wearing, silicon carbide faces and Thordon’s proprietary elastomeric bellows to provide an unlimited shelf life compared to rubber-based bellows, which need periodic replacement. It also features a unique secondary seal with “Safe Return to Port” capability. In the unlikely event that the primary sealing surface is damaged, this emergency function allows the shaft to turn at reduced speed enabling the ship’s safe return to port for repairs.



THORDON BEARINGS HELP KEEP **WORLD'S OLDEST STEAM DRIVEN TUG OPERATIONAL**



One of the world's oldest tugboats, the 117-year-old, steam-driven Daniel Adamson, is set to return to service offering short cruises along the River Weaver, a tributary of the fabled Mersey River in England, after the completion of a project to install new propeller shaft bearings.



The 1903-built steamship, rescued from scrap merchants 15 years ago, was fully restored in 2016 at Birkenhead's Cammell Laird yard, the original builder of the vessel. Thordon Bearings' SXL water lubricated propeller shaft bearings were installed last year after competitor bearings failed.

Chris Simmons, Sales Manager, Duwel Group, Thordon Bearings' distributor for the UK, said: "We were invited to visit the yard to investigate the potential to retrofit with a Thordon bearing solution following the loss of the starboard propeller.

"There seemed to be a lot of damage compared to the other journal positions and it appeared the bearing had suffered from hydrolysis. I could see that some areas of the inside diameter surface had deteriorated and were missing."

Thordon SXL water lubricated bearings were supplied in April of 2020, but due to the COVID-19 crisis, the project was delayed until November.

"Initially, we were only going to replace the bearing on the starboard shaft but as the project progressed, it was agreed that the port propeller shaft bearing should also be changed. So, we ended up supplying 203mm (8in) diameter SXL bearings for each shaft," said Simmons.

Andrea Ward, Director, Daniel Adamson Preservation Society, said: "As a charity, supported by volunteers, we didn't have a big budget available for the docking and bearing replacement so soon after the restoration three years ago. But after evaluating the reliability and robustness of the SXL bearings we believed it would be prudent to the life of the vessel to replace the existing shaft components with the more reliable, robust Thordon SXL solution."

Aside from reliability and performance, another contract clincher was product availability, said Thordon Bearings' Regional Manager, George Morrison.

"Despite the stringent safety and social distance measures in place we have been able to continue production throughout the pandemic as an essential supplier, offering better lead times than our competitors. This has given us a distinct advantage. It also appears that Duwel is the only original bearing manufacturers' representative in the UK providing comprehensive sizing dimensions for the machining/ installation processes."

Commenting on the success of the project, Simmons, said: "Boarding this remarkable vessel is stepping back in time. Many of the volunteers are septuagenarians but they're carrying out all of the tasks required to operate a steam engine, including the 'fireman' role, shoveling coal. Tough work. I'm not sure I would be able to keep that up for too long – apparently there is a knack!

"It was a privilege to be involved in this project and wonderful to see skilled craftsmanship combined with modern bearing upgrades to ensure many more years of service." 



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