

Groundbreaking Longevity

True to its commitment dating back to the Middle Eastern oil boom of the 1970s, the government of Abu Dhabi has spent its wealth on improving infrastructure and dramatically changed the industrial and economic landscape. The physical landscape too has changed, as colossal earth-moving projects have dug canals, developed islands and built entire new ones.



Central to many of these developments has been the National Marine Dredging Company (NMDC), whose dredging ships dig and suck up underwater soil for large waterway construction projects. The company's largest ship is the 27,500hp *Al Sadr*, built by IHC Holland. It measures 117.5m (385ft) x 20.3m (66ft) and is one of the most powerful dredgers in the world.

Ever since the *Al Sadr* was built in 1999, Thordon composite bearings have functioned without fail in the cutter shaft, which has cut through millions of cubic metres of mud. When engineers finally replaced the bearing in July 2009, it showed only 2mm (.07in) of wear after 10 years. The Thordon distributor, Rafid Qureshi of Ocean Power International LLC, even advised that the bearing could remain in operation, but NMDC management decided it had had a good run and replaced it while the vessel was already drydocked. "It probably could have gone longer," says

Qureshi. "I've seen these bearings last 12 to 15 years."

A cutterhead dredger uses a spinning head covered with an excavator piece. Throughout its life, the end shaft is repeatedly thrust into the floors of lakes and oceans. Besides performing its heavy industrial function, the bearing must withstand abrasive water that inevitably seeps through.

"This is the first bearing after the actual cutter that cuts the soil," says Jurjen Visser, Marine superintendent at NMDC. "It is always underwater and absorbs most of the shaft's movements."

After 10 years, in contrast to the nearly-intact composite bearing, the metal retaining ring that holds it in place is completely worn – indicating that a metal bearing would have required several replacements under such harsh conditions. During last summer's retrofit, at Qureshi's suggestion the Thordon stave bearing in the *Al Sadr* was replaced by

a Thordon Composite tube bearing, an even more economical option that's easier to install.

"We have experienced within our company that exchanging the bearing when we use complete bushes is far easier and quicker," says Visser. "Furthermore, it is cheaper to buy three bush bearings than a whole bunch of stave elements."

As of 2006, NMDC vessels had dredged 890 million cubic metres (3.1 billion square feet), which the company claims is enough to build a road 20 metres (65.5ft) wide, 1 metre (3.2ft) deep and 40,650 kilometres (25,250 miles) long – that would almost go completely around the earth at the equator.

The new Thordon bearing in the *Al Sadr*'s end shaft has big tasks ahead. By the end of 2010, NMDC aims to complete an AED 1.5Bn (\$313M) contract by the Abu Dhabi Urban Planning Council (UPC) to construct the Mussafah canal. This canal will play a key role in the development of Mussafah Industrial City by allowing ships of up to 9m (30ft) draft to pass. And as of November 2009, the company was awarded a three-year, AED 2.3Bn (\$626M) project to construct four artificial islands in the Zakum marine oil field.

As for the now-retired bearing, Thordon representatives continue to marvel over its longevity. It sustained most of its minimal damage from welding spatter when it was removed for inspection.

"Except for the first 200mm (7.87in) length at the mouth, the rest is perfect," says Qureshi. "In my opinion it could have run another 10 years." ■

