

Wärtsilä Sandguard for dredger applications

CASE STUDY



In summer 2017, Wärtsilä was approached by California-based Dutra Group regarding one of the company's hopper dredgers, the 'Stuyvesant'. This 113 metre (372 feet) long dredger is the second largest vessel of its type in the United States, operating out of the port of Mobile, Alabama. The reason for the group contacting Wärtsilä was that the ship's lip seals were wearing out too quickly, meaning that they needed to be replaced on average once a year. This often involved taking the ship out of service for unscheduled repairs in dock, thereby creating considerable extra costs. The owners requested Wärtsilä to investigate the problem and suggest an appropriate solution.

CHALLENGE

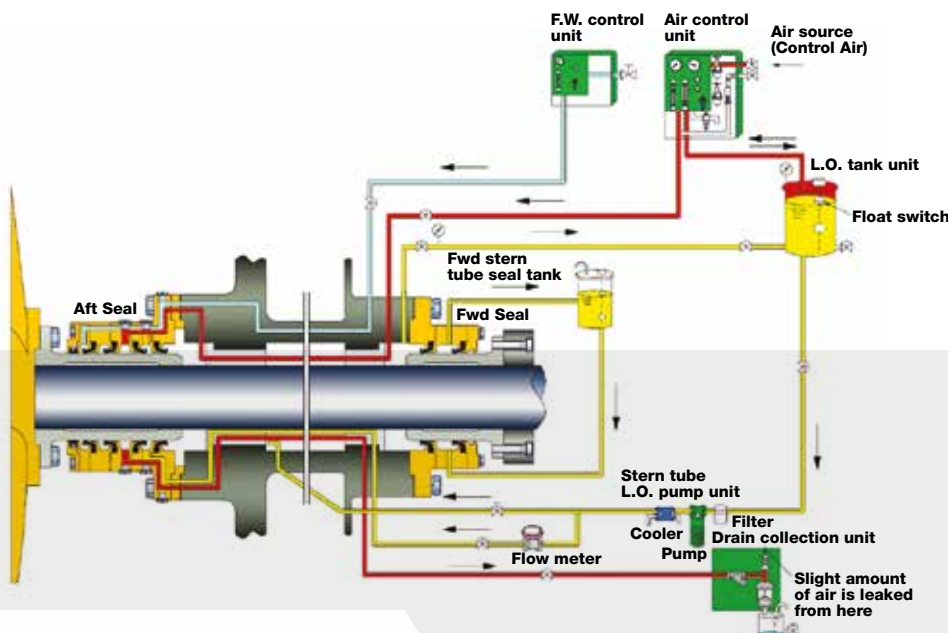
- Abrasive water conditions were wearing out the lip seals very quickly.

SOLUTION

- We supplied the customer with a Wärtsilä Sandguard sealing system. The system uses a water flush and an air barrier to keep abrasive particles out of the seal.

BENEFITS

- The vessel will now be able to go between scheduled dry docks without having to replace their lip seals.



Wärtsilä Sandguard system arrangement



ANALYSIS

It was evident that the installed seals were not capable of withstanding the abrasive conditions in which the dredger operates. The sand, silt and other pollutants being dredged were causing premature wearing of the lip seals. The Wärtsilä team proposed that the existing system should be replaced with the Wärtsilä Sandguard stern tube seal system. The Wärtsilä Sandguard sealing system is designed for vessels operating in inland waters, coastal waters or dredging applications that experience high levels of abrasives in the water. A protector ring prevents unwanted particulates entering the seal and any particulates that do make it past the protector ring are removed by the water flush. This water flush continually removes sand silt and any other abrasives from the seal. Also incorporated is an anti-pollution system, similar to that of the renowned Wärtsilä Airguard system, this separates the stern tube oil from the seawater by an effective air barrier. The seal is capable of withstanding vibration that can cause loss of sealing efficiency, making it the right solution for this particular vessel and other vessels operating in similar conditions.

“In just the first two years, Dutra Group has already seen savings in the hundreds of thousands of dollars and will continue to realise returns on their investment in years to come.”

Iain Searle, Port Engineer

INSTALLATION

The work was carried out in September 2017 following consultation with representatives of the owners and the shipyard. The existing seal system was drained out, and the necessary piping modifications were made. The Wärtsilä Sandguard systems were installed, with four-lip aft seals instead of the previously installed three-lip seals. The rest of the system comprised of the pump and tank unit, the air control unit, the drain collection unit, the alarm panel, the pressure gauge unit, and the water supply unit.

CONCLUSION

The installation was completed and commissioned as planned. The vessel can now maintain normal scheduled dry-docking intervals. There is no longer the need to make extra unscheduled dock visits to change worn and damaged lip seals. By installing the Wärtsilä Sandguard systems, the ship now has its entire propulsion shaft-lines fitted with Wärtsilä solutions. Environmentally Acceptable Lubricants (EALs) are not required for the Wärtsilä Airguard or Sandguard seals because the void space within the seal captures any water or oil, which is transferred to inboard tanks for monitoring and further treatment. Vessels can therefore satisfy the 2013 US EPA Vessel General Permit (VGP) whilst using mineral oil.

The owners now have a single point of contact for all the installed equipment. This not only saves time but enables greater optimisation of the shaft line performance.

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