

Constructor Palm Jumeirah Dubai Van Oord

Established in 1868 by Govert van Oord, Van Oord is today a conglomerate of Dutch dredging companies, lately best known as constructor of Palm Island, Dubai, the 'Eighth Wonder of the World' and one of the few manmade features visible from outer space.

By Henk Key, contributing editor, GIM International

The Netherlands is shaped predominantly by the rivers Rhine and Meuse, and fighting flood has become a natural habit of the Dutch. Sometimes flood water arose from the rivers, but on other occasions the rivers joined forces with the North Sea, causing high tides and strong winds to send huge waves smashing across the delta area. Their centuries-long fight against the water turned the Dutch into specialists in constructing dykes and reclaiming inun-

dated land. Keeping rivers navigable and harbours open means continuous dredging. A specialist in this arena is Van Oord Dredging and Marine Contractors, headquartered in Rotterdam. The company constructed the famous Palm Jumeirah and the archipelago (The World) in Dubai: over three hundred islands forming a map of the continents (Figure 1).

Long Shifts

At Van Oord House in Gorinchem I meet chief surveyor Dick Jansen, who arrives in motorcycle leathers and riding an impressive machine. Myself a spare-time motorcyclist, I ask him with some envy how come he is on his bike during working hours. He explains, "When offshore we remain onboard a vessel for four weeks, working day after day in twelve hours shifts. During the four weeks leave onshore, one needs freedom and this is what a motorbike brings." He goes on to tell me shifts change at noon, so that the two survey teams each share equal daylight and hours of darkness. "This is especially important when working up north." Dredging or land reclamation activities mean working hours often depend on external factors, including tide and temperature. Twelve hours working is followed by twelve hours of leisure, most of which is spent sleeping. Cabins are provided with satellite TV and DVDs, and recreation and fitness rooms keep the crew mentally and physically in shape. For the same reason, no alcohol is served in the bar.



Figure 1, Satellite image of Dubai, United Arab Emirates; (bottom) bird's eye view of Palm Island.

Positioning

Dick is working on the Tertnes, a Flexible Fall Pipe Vessel (FFPV); Figure 2 shows an artist's impression of a similar vessel, the Nordnes. The Tertnes can carry up to 10,000 tons of rocks, and the 'flexible fall pipe system' enables the crew to place rocks on the seabed with an accuracy of 50cm, up to 1,200m below the surface of

the water. This capability is vital for creating precision foundations or constructions to support pipelines and the like. The survey team, consisting of one chief surveyor, two online surveyors and four offline surveyors (or data processors), uses a diversity of instruments for different tasks. The vessel is positioned using six GNSS systems, achieving near RTK quality through high-accuracy differential corrections. Other survey instruments include two gyro systems and several roll-and-pitch sensors. The position of the mouth of the fall pipe is monitored by acoustic systems together with bathymetric sensors, cameras, and the aforementioned sensors. During rock placement

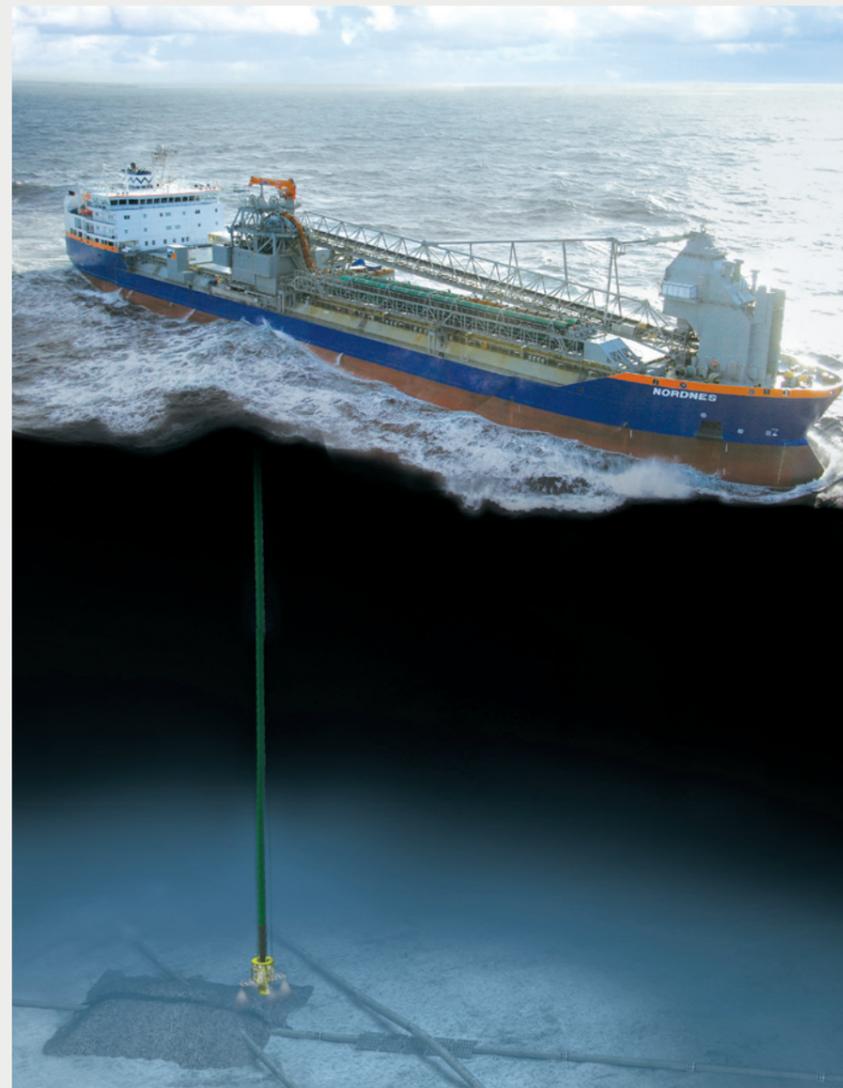


Figure 2, Artist's impression of the Nordnes. With a moulded depth of 14.50m and dimensions of 175m by 26m, cargo volume is 24,200m³. Loaded (27,200 tons) the two engines of 4000kW each allows a speed of up to 14.7kn. Total power installed is 16,572kW.

operations the vessel will make several survey runs, allowing the survey team to perform the required pre-, interim- and post-

tions: VOSS (Van Oord Survey Software)." Special adaptations are made to standard software such as AutoCAD, Terramodel

Delays caused by survey team would be unacceptable

surveys. Datasets gathered during these survey runs are matched, using unique seabed features, so that rock placement activities may be assessed.

Redundancy

Since surveys and data processing have to be done to tight time schedules and often in bad weather, the work is demanding on both staff and equipment. A comprehensive training programme ensures personnel are kept up to scratch; equipment is maintained by in-house facilities. "Today our survey department employs around three hundred surveyors," Dick tells me, adding, "Many are of Asian origin, holding a Bachelor and sometimes a Masters degree. Nevertheless, we extend their skills by in-house training to meet our required standards". The maintenance team consists of ten specialists equipped with advanced tools to keep the survey equipment operational and prepare instruments for varying projects. "We also develop our own software applica-

and PDS2000. "The operating costs of vessels like the Tertnes are high, and delays caused by the survey team or malfunctioning instruments would be unacceptable. Spare instruments running simultaneously often prevent setbacks; for example, although two GNSS receivers would suffice, we mount six!"

Health and Safety

Safety has top priority within the Van Oord organisation and every crewmember, surveyors included, are issued with his or her own PPE (Personal Protective Equipment) and receives comprehensive safety training before going offshore. This safety training includes first aid, fire fighting, survival at sea and Helicopter Underwater Escape Training (HUET), where staff are trained in what to do when a helicopter crashes. Unannounced emergency exercises keep the crew alert while on duty. ♦

Van Oord NV, Watermanweg 64, 3067 GG Rotterdam, the Netherlands, email info@vanoord.com



Figure 3, Dick Jansen, chief surveyor, indicates some of the GNSS antennas onboard.