DAMEN DREDGING JOURNAL

Products, markets and developments from our business partners’ perspective.

TSHD SAMUEL DE CHAMPLAIND

TO BE CONVERTED TO LNG IN A EUROPEAN FIRST

This summer saw another milestone in the drive towards cleaner shipping in European waters.

DAMEN CSD450

NEARLY 20 YEARS ON

Hunan Xingyu Construction Co. Ltd is still finding plenty of projects for its Damen Cutter Suction Dredger 450, more than 17 years after this robust dredger was built.
With the dredging market in Bangladesh having grown exponentially in the last few years, Western Engineering (Pvt.) Ltd (WEL) has committed to a substantial fleet investment programme.

This follows the Bangladesh Government’s mandate to dredge all the major river routes to restore and maintain navigability, and/or increase water retention for the dry seasons in the many rivers and large water bodies.

Established in 1998, WEL was founded by Managing Director Bashir Ahmed with the aim of significantly contributing to the development of Bangladesh by participating in nation building projects undertaken by the government. The company is involved in a wide variety of projects including the construction of roads and bridges, as well as hydraulic structures and water control structures, capital & maintenance dredging and land reclamation works. The company places a special emphasis on adopting a sustainable approach in all aspects of its business dealings.

Munawar Riasat, WEL Director of Dredging, explains that the government’s recent mandate has led to a boom in investment in the dredging market with more than 40 dredgers being imported from various dredger manufacturers within the last two years.

**Own dredging division**

“In view of the Government of Bangladesh’s recent initiative to undertake major dredging projects, WEL started its own dredging division, Western Dredge (WEL) in 2014.”

Since the time of its inception, Western Dredge has acquired an impressive fleet of cutter suction dredgers from various internationally recognised dredger manufacturers such as Damen, he says. Currently, the Western Dredge fleet consists of 15 cutter suction dredgers and various other supporting vessels. “These are operated by a team of highly experienced and motivated individuals with the support of a proactive management team,” Mr Riasat emphasises.

The company has been engaged in several high profile capital and maintenance dredging projects in Bangladesh. “We are proud to have undertaken and successfully discharged the capital and subsequent maintenance dredging operations for Mongla Port navigational channel, and we are currently engaged in capital and subsequent maintenance dredging operations for the Rooppur Nuclear Power Plant navigational channel, as well as maintenance dredging operations for some major ferry routes in Bangladesh. And several other projects will be undertaken in the near future.”

**Fleet expansion**

With the growth in the dredging market, the company has embarked on an ambitious fleet expansion programme. Just this year alone, Western Dredge is acquiring six Damen cutter suction dredgers. The company purchased its first two Damen CSDs 500 in January and then added four more. Two have already arrived and been allocated to dredging projects and the remaining dredgers are all expected to be active on site by mid-October.

WEL is a new client to Damen. The partnership began following correspondence with Damen’s local consultant in Bangladesh and subsequent visits from Damen’s Regional Sales Director, Rabien Bahadoer. “We were able to establish that Damen has a trusted recognition of its commitment and steadfast dedication to delivering high quality performance and production, fuel efficiency in production and that they have a long duration of useful life.”

**Maximising production**

Mr Riasat is hopeful regarding prospects for the company. “Our future expectation is that while there will be large investments in dredging projects by the government, the market will be a competitive one due to several new entrants joining the dredging scene. We, however, hope that due to Western Dredge’s early start in this newly flourishing sector we possess a competitive advantage that will allow us to rise to the top of the dredging market here in Bangladesh.”

Since its inception in 1998, WEL has completed more than 30 different types of projects with an aggregate project value of 1.52 billion Euros. WEL has been awarded a ‘special contribution award’ in recognition of its commitment and steadfast dedication to delivering high quality performance in dredging its projects. WEL currently employs over 500 personnel engaged in 36 different projects throughout Bangladesh.
DOUBLE WHAMMY
COMBINING THE VERSATILITY OF A MULTI CAT
WITH THE DREDGING PERFORMANCE OF A DOP PUMP

Saudi Arabia-based Murjan Al-Sharq Marine Services purchased a Multi Cat 1988 in summer 2017. And, while Damen’s Multi Cats are well known throughout the maritime industry as being multidisciplinary vessels capable of tackling a huge range of jobs, this new vessel named Murjan 40 has taken that reputation for ‘all-round’ workability one step further.

The most notable modification that Murjan Al-Sharq Marine Services specified for the Murjan 40 was the installation of a Damen DOP Submersible Dredge Pump 250. With this addition, the client can add the specialist skills of shallow water dredging to its scope of maritime services.

“By adding a DOP pump to a Multi Cat, we instantaneously have a dredger – but a dredger which is very useful,” says Vice President Chris Clark. “And, now, facilitated by Damen Customer Finance, we are pleased to have purchased our first Damen vessel. This is not just a versatile vessel, but with the DOP we have taken delivery of a complete package. “

The complete package
Murjan Al-Sharq Marine Services started discussing serious vessel options with Damen five years ago. “This continued when, three years ago, Mr Kommer Damen paid us a visit – something that meant a lot to us,” says Vice President Chris Clark. “And now, facilitated by Damen Customer Finance, we are pleased to have purchased our first Damen vessel. This is not just a versatile vessel, but with the DOP we have taken delivery of a complete package.”

The company intends to operate in areas where other vessels cannot. “The company already has several contracts in place,” adds Mr Clark. “The DOP is in itself also highly adaptable. With different suction heads, we can work in a variety of soils. It can take on the whole range of specialist jobs with this vessel. We call this ‘surgical dredging’ because of the precision required. What’s more, the versatility of the Multi Cat means that we can also use it for other jobs such as transportation, towage, dive support, pollution control and anchor handling.”

Cost-effective alternative
Yielding a 1,250 m³ per hour mixture capacity, the DOP250 can either be deployed with the crane or over the stern with an A-frame. Considering the relatively small dimensions of the vessel – just 19 metres long with an 8-metre beam – the DOP’s compact, hydraulic-powered design made it an extremely suitable choice. Looking to make their dredging operations straightforward, Murjan Al-Sharq Marine Services consulted the company’s list of services, this is an important point. Murjan Al-Sharq Marine Services does not limit its skills to the dredging sector: it also provides marine construction and maintenance, diving and subsea inspection services – including coral reef removal. Therefore, the Murjan 40 must also be able to work on these jobs too.

DOP250:

DOP250 pump can undertake the full range of tasks that a Multi Cat can do as well,” states Abdullah A. Natheer, Chairman of Murjan Al-Sharq Marine Services. Considering the company’s list of services, this is an important point. Murjan Al-Sharq Marine Services does not limit its skills to the dredging sector: it also provides marine construction and maintenance, diving and subsea inspection services – including coral reef removal. Therefore, the Murjan 40 must also be able to work on these jobs too.

The development of the WID2915 validates the concept within a single hull, and thereby opens up the possibility of substantial cost savings for commercial harbours that require frequent maintenance dredging as well as ship handling services. The nozzle design of the ARSET technology combined with the removal of the need to dispose of the sediment makes it suitable for a range of projects. As well as navigation channels, ARSET is highly effective in ports, marinas, and areas with limited access. It is also efficient in cleaning underwater structures such as quay and locks. Additional benefits of vessels equipped in this way include their small size and manoeuvrability, and non-invasive technique of using air and water makes it ideal for environmentally-sensitive areas. The technology is well-established, but only now has the potential from merging with it into a tug capable of being realised by Damen.

DAMEN SHIPYARDS HARDWICH in the Netherlands is currently building a combination dredger/tugger that is believed to be the first of its type to be built anywhere in the world. This unusual order came from Baggerbedrijf De Boer B.V., known internationally as Dutch Dredging B.V., via its subsidiary De Boer Remorquage SARL. The dredger/tug is being purchased to allow the company to fulfill a 10-year contract with Grand Port Maritime de Guayaquil in the ports of Guayaquil and Guayaquil in French Guyana. Its primary role will be to undertake dredging operations in the ports and to assist vessels entering and leaving harbour.

A Damen ASD 2310 SD (Shallow Draught) tug has also been ordered and as the two ships will be the only support vessels available in either location they will also be used for surveying, the transportation of equipment and cargo up to container-sized loads, and will be equipped to handle on-the-water emergencies including fire fighting.

Guaranteeing performance
Meeting the demands of such a unique brief required extensive consultation and development work. Damen led the design, and helped optimise the dredging towing balance so as to achieve an equilibrium within the given specifications. Dutch Dredging also made a significant contribution with its knowledge of the unique technique of water and an injection dredging, that has has been built up over 20 years. Its experience over the past 12 years of operating in the specific conditions of French Guayaquil has also been very useful.

As a result the dredger/tug, designated the WID 2915, will be fitted with water injection enabling it to dredge using the Air and Water Injection Dredging (ARSET) method. This is a hydrodynamic technique that uses water jets and air to disturb the sediment and move it up into the water column from where it is naturally carried away. It is an unobtrusive and cost-effective way to conduct maintenance dredging and does not require the physical transportation of sediment by barge or pipeline. While dredging, the WID 2915 will be fully diesel-electric with the CAT512 main engines acting as generators to power the electrically-driven dredge pumps and hybrid thrusters.

The contract for the two vessels was signed in December 2016 with the WID 2915 due for delivery in March 2018 and the ASD 2310 three months earlier in December this year. Since then the build has proceeded well following the extensive engineering phase required to reconcile the dual functions. Combining multiple roles in a single vessel always requires compromises, however, in this project, the merging of dredging and ship assistance duties has gone particularly well, resulting in no loss in performance for either of the two main functions.

A Damen partnership
“We chose Damen for its reputation for designing and building both tugs and dredgers to a high standard,” commented Dutch Dredging CEO Hugo van den Graaf. “This made the ideal partner for the construction of a custom, multi-purpose dredger. In addition to this, both vessels will be built under French rules and Classification, something in which Damen is also experienced. French Guyana is a Department of France, and is therefore best known for being the location of the Guayas Space Centre, which is used by the European Space Agency.

The success of this deal was based on trust and a respect for each other’s knowledge that the counterparties quickly developed,” added De Wet Wierum, managing director of Damen Shipyards Hardwich. “While we know Iskes Towage and Salvage well, this is our first time working with Baggerbedrijf De Boer. Yet in just a few months of collaboration we developed the WID 2915 by taking an existing Damen design and adding the collective experience of the two project partners to create the optimum solution.”

Joining Dutch Dredging and Damen in the project in the Ummarden based Iskes Towage & Salvage, which is a Dutch Dredging’s co-owner in the French subsidiary company De Boer Remorquage SARL, the legal entity that owns the vessels. Iskes will provide the towing activities of both vessels and is committed to recruiting and training a number of local staff and crew in the skills required to man and maintain the two new acquisitions in particular and workforces in general. Damen and Damen already know each other well, with Iskes operating a number of Damen tugs, including amongst others three ASD 2610, two ASD 3212 and a Damen ASD 2411. Its operating experience in harbour towing and assistance provided additional valuable input for the design and build process.

The first of many?

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More vessels of this type may yet appear in diverse locations around the world in the years ahead.
In introducing Heuvelman-ibis, Mr Stuut shows how the company, which was founded around 40 years ago, has grown into a multidisciplinary operation. “We have two offices located in the Netherlands and one in Germany. And our skills set includes maintenance dredging, dike and dam wall construction, coastal protection and hydrological surveys.”

“From starting out with one floating platform four decades ago, we now have 12 floating assets and 16 cranes. We can take on inland projects as well as work in and around harbour entrances,” he explains.

“However, a couple of years ago we decided that we were lacking a cutter suction dredger in our fleet. At the time these accompanying photos were taken, the company has remained in close contact with Damen to discuss the various opportunities the vessel can determine its own position at the worksite without needing a support boat.”

A notable aspect of the Groningen contract is the timing. This is because Heuvelman-Ibis first secured a dredging contract that required a CSD before finalising the deal with Damen. “It was very important, therefore, that their delivery time matched our requirements,” notes Mr Stuut. “So we made some clear agreements with Damen regarding the need for a fast delivery – and these were flawlessly executed.”

After sales support Since Heuvelman-Ibis took delivery of the Groningen, the company has remained in close contact with Damen to discuss the various opportunities the vessel can open up. “For example, we consult with them about how we can best tackle a certain job, about performance, distances involved and what materials we want to dredge,” he explains. “This ongoing service and advice is very important to us. And, although we haven’t reached the point yet where we need any spare parts or maintenance, we have complete faith that we will also receive this support when required.”

At the time these accompanying photos were taken, the Groningen was due to start its first dredging contract the following week. “We will be keeping a production to a maximum on this first job,” says Mr Stuut proudly. “After all, the second contract has already been finalised and we have a schedule to keep!”

Delivered back in May 2015, the Trailing Suction Hopper Dredger Barito Equator marked some significant achievements for both the Indonesian dredging and shipbuilding industries.

First of all, the 80-metre long vessel was the first of its kind to be built in Indonesia; construction taking place at Steakfast Marine shipyard in the country’s Kalimantan region on the island of Borneo. With Damen Technical Cooperation assisting the build process, the local yard could benefit from the transfer of a considerable amount of knowledge and technology. And then, for the vessel’s owner – Indonesian dredging company Pelayaran Fortuna Nusantara Megajaya (PFNM) – the arrival of the Barito Equator represented a major step forward in the development of local dredging skills and experience. The vessel has also played a critical role in improving and then maintaining vital cargo and transport links that, in turn, have been advantageous to the local economy.

Since delivery, the Barito Equator has been operating out of the port of Banjarmasin, the capital city of South Kalimantan. Before construction of a 15.5km canal in 2008, the port was accessible just eight hours per day. “The local government realised how important it was to keep the port open 24 hours a day – and the creation of the canal was finally agreed upon to guarantee the 24/7 accessibility,” says PFNM Operations Director Arie Hermanto. “The Barito Equator’s primary task has been the maintenance dredging of this port access canal. Every year we have to take out around 4 million cubic metres of mud from the canal to keep the depth to 6 metres.”

Looking at the subject from a regional picture, he confirms, the vessel has also contributed to economic growth in the area. “The agricultural, mining and industrial sectors in South Kalimantan depend heavily on the Barito River for trading outside the region,” he says. “Because the port itself is on the Barito river – it is very important to keep it properly maintained.”

Now, just over two years since vessel handedover, Mr Hermanto is in a good position to give Damen some hands-on operational feedback of the vessel’s performance. “We are happy with the Barito Equator’s performance. The capacity of mud we take out is more than our target. The vessel is very effective and efficient, with low fuel consumption. We can work 24 hours a day with a maintenance period of around 36 hours per month.”

Within the first two years of dredging, PFNM has increased the depth of the canal by 1 metre, reaching the current desired depth of just over 6 metres. A regular maintenance programme has helped accomplish such impressive results. To this end, PFNM keeps spare parts on stock. “Right now I have a lot of spare parts ready for routine maintenance to make sure that we can work 24 hours a day. Our biggest problem is long lead times for the bigger parts, but this is because our working area is in a small town – and all the expertise lies in Europe.” From the vessel’s crew, Mr Hermanto has heard positive reactions. “The vessel demonstrates the development of dredging expertise in Asia. The crew enjoy working on a vessel like this – it is very modern with luxury equipment. And in terms of day-to-day maintenance and operating the vessel, it is very straightforward.”

Looking at what PFNM and the Barito Equator have achieved in the first two years since delivery, the local Indonesian dredging sector is looking towards an exciting and productive future.
VERACEL CELULOSE USES DOP250 TO MAINTAIN THE FLOW

Veracel Celulose, the Brazil-based pulp manufacturer, has enlisted Damen’s support in its quest to maintain sufficient depth at its maritime terminal. Veracel and Damen jointly evaluated the on-site situation in order to develop the correct situation.

This turned out to be a DOP250 submersible dredge pump and a Booster Station BS250. To increase efficiency, the DOP is equipped with a mining head fitted with jet water nozzles, specially designed to loosen the sand. The pressurised water is delivered to the nozzles by a separate diesel driven jet water set. The DOP pumps the dredged material over a distance of 450 metres to the booster station, which transports the mixture a further 800 metres to the designated discharge site.

Veracel has ordered a production measuring unit (PMU) as an add-on to the equipment. The PMU will enable Veracel to measure dry sand production in real time, increasing efficiency yet further.

VERACEL CELULOSE USES DOP250 TO MAINTAIN THE FLOW

McCALLUM BROTHERS RETROFIT DOP FOR NEAR AND OFFSHORE SAND MINING WORK

McCallum Brothers Ltd has retrofitted a DOP250 to an existing sand mining dredger in Auckland, New Zealand. The DOP will be used for nearshore mining of high quality sand for the construction industry and for offshore mining for beach replenishment.

The DOP is lowered on a wire to operate at depths from -15 metres to -20 metres. The mixture concentration is boosted using pressurised jet water on the drag head.

Along with the DOP, Damen has supplied McCallum Brothers with a total dredging package. The turnkey package includes a diesel-hydraulic power pack and jet water pack, which were mounted below deck, as well as dredging instrumentation for pump process monitoring, plus the necessary hydraulic hoses and discharge piping.

DAMEN UNVEILS ELECTRIC DOP

Damen Dredging Equipment has recently unveiled its new electrically-driven EDOP pump. The Damen DOP pump has enjoyed success in the dredging industry since its introduction 25 years ago. It is a wear-resistant, robust tool suited to diverse dredging projects. The new, electrical DOP pump is every bit as capable as the hydraulic predecessor; this development gives the DOP pump added versatility to be more applicable to even more projects.

The new system draws on recent advances in electric motor technology. The EDOP provides dredging operators the flexibility to carry out projects where clean and quiet operations are required. Possible applications include hydroelectric dams, where the power is already present, residential areas where low noise levels are vital or environmentally sensitive areas where the use of oil is not allowed.

The EDOP boasts a 93% drive efficiency. Due to swift connection to power connectors, operators can install the system in their projects as a ‘plug and play’ configuration. Using wireless control connections, the whole system can be remote-controlled from a distance. The newly-introduced EDOP pump can be powered by a generator set, resulting in quiet operations. Just as the hydraulically driven DOP has done for the past decades, the EDOP is likely to fan out over the globe on every kind of dredging job imaginable.

MINING IN THE SURF

At the Tormin Mine on South Africa’s west coast, Australian company Mine Site Construction Service has employed a Damen DOP250 with a cutter head. The DOP is used to mine heavy mineral sediment (HMS) in the surf zone.

The HMS is extracted from just below a layer of fairly standard quartz sand and contains rutile, magnetite, garnet, ilmenite and zircon. Historically at the site, mining operations have been conducted using excavators and trucks, which must relocate with the tides. The DOP, however, has been mounted to an amphibious excavator along with its power pack, and can now mine continuously.

The DOP is mining sand at a maximum dredging depth of -10 metres. The sand mixture is then pumped in a concentration of up to 25% over a distance of 250 metres, over a cliff of 15 metres in height. Onshore, the processing plant separates the minerals.
The CSD450 was actually the first dredger Damen built. Just recently, Hunan Xingyu Construction’s Damen IS STILL GOING STRONG NEARLY 20 YEARS ON, HUNAN XINGYU engineering, amongst other specialties. Hunan Xingyu Construction specialises in water engineering, municipal, highway engineering, electrical conservancy and hydropower projects, dredging and cleaning project where it dredged a total of 2.7 million cubic metres, in depths of up to 4 metres. The Xingshui River dredging and embankment reinforcement/construction project began in March.

Major river cleaning project
Just recently, Hunan Xingyu Construction’s Damen CSD450 has completed an eight-month long river cleaning project where it dredged a total of 2.7 million cubic metres, in depths of up to 4 metres. The Xingshui River dredging and embankment reinforcement/construction project began in March. The Damen CSD450 also has a range of options that can always be added on as well, such as the spud carriage, anchor boom, automatic or survey software, even after many years in operation.

Commenting on the vessel’s longevity, Mr Xiao says: “Our company carries out regular inspections of the main equipment, checks the data from the monitoring instruments frequently and tackles the problem at once.” Damen also makes it straightforward to replace parts such as the cutter teeth and the dredge pump.

This has certainly helped keep the vessel running smoothly over the years. “In addition it is very important to have extensive operational and maintenance experience: the operator must be familiar with the rules of safe operation.”

Mr Xiao says: “We are very satisfied with our Damen vessel, so much so that we are considering ordering a second dredger with Damen, again with a dismantable spud carriage.

To facilitate a quick delivery to clients, the Damen CSD450 is in stock. The total installed power of 941 kW ensures that all functions on board can work independently and simultaneously. The heavy-duty, 80 kN side wire winches ensure efficient dredging operations at any location.

In stock Efficiency of the CSD450 is optimised as its swing width is 34 metres, due to the long and spacious positions.

The vessel has a total weight of 115 tonnes and a pipe diameter of 450 millimetres and is equipped with a depth indicator and vacuum/pressure indicator for the dredge pump.

A spacious, ergonomically designed control cabin (including air conditioning and heating) is another important factor.

Additionally, the Damen CSD500 is currently built in China and available from stock. FREE ONLINE TOOL ‘SANDY’ HELPS DREDGING CONTRACTORS FIND THE RIGHT CSD AND EQUIPMENT FOR THE JOB IN MINUTES

In a pioneering move, Damen Dredging has introduced a free online advisory tool for contractors designed to help them find the right Cutter Suction Dredger and equipment for their project.

Named ‘Sandy’, the easy-to-use tool can be found at www.dredgetinder.com.

For every dredging job, whether it is a maintenance dredging, sand dredging or capital dredging project, the local government will issue a public tender. Damen is aware that dredging contractors have to tender for these jobs worldwide on a daily basis and sometimes they are not certain about which dredger is best suited for the job.

Unburdening contractors
Contractors have to put in a considerable amount of effort when submitting their offers to calculate the estimated production of each different job, and constantly have to make new calculations involving various production parameters. Therefore, the online dredge job calculator unburdens the contractors of this time-consuming and costly process. It also assists clients who are not tendering but are looking to purchase a suitable dredger.

Sandy is the brainchild of Lennart Koning, Dredging Production Specialist at Damen Dredging Equipment. He explains the inspiration behind this innovative tool: “I was always getting a lot of emails in my inbox asking similar questions - what size dredger do I need for a certain soil type etc. and I was already working on an ‘OPEX calculator’ project using multiple mathematical models to determine production levels.

“I am a keen windsurfer and when I was out there on the waves a sudden brainwave struck me. I could change this calculator and make a pre-selection model with the given project parameters, enabling the tool to provide the advice needed.”

Realistic performance
Lennart stresses that Sandy gives realistic information about what production rate a contractor can expect, which is vital. “We will give advice based specifically on the customer’s project i.e. it will not say a larger CSD500 should be used when a CSD450, with the addition of a spud carriage or a booster station, is perfectly adequate.

Each dredging job is calculated on dredge production. Moreover, by simply adding an option, such as a spud carriage, the contractor can see the potential efficiency gain immediately.”

Sandy is based on a full size calculation model, drawing on an extensive database that performs all the necessary calculations and takes into account what equipment is required.

Dredger & options
Contractors can see for example, the impact on production if harder soils are encountered or if they need to manoeuvre the vessel. “Often people think it is only the production of the pump that is important and this is not the case. It does not give the whole picture. The total production of the dredger is determined by the lowest of the following three productions: swing production, cutter production and pump production and a further lowered by the time due to changing spud poles and anchors, maintenance activities and crew schedules etc.”

“Damen Dredging cares about giving customers realistic performance indicators not just high numbers.”

Sandy provides detailed advice about which cutter suction dredger fits best, but also which options are complementary to the specific project. These options include the anchor boom, spud carriage, wedge piece for shallow dredging and a booster station for longer pipelines as they have a direct impact on the production.

“When going to the website, the contractor enters the defining characteristics of the dredging job, including factors such as deep water they have to dredge, how much soil should be dredged, when they plan to start, the soil mix, the type of sand, course or fine, and the discharge distance.

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nervous systems’ of these powerful vessels. In recent years, process automation provider The electrical and automation configuration of modern dredgers can be thought of as the ‘central POWERSPEX – AUTOMATION SPECIALISTS

The electrical and automation configuration of modern dredgers can be thought of as the ‘central nervous systems’ of these powerful vessels. In recent years, process automation provider Powerspex has designed and delivered these systems for 120 Damen Cutter Suction Dredgers. Established in 1997, Powerspex started out working in the steam generator and furnace sector. However, as the years rolled by, the company’s skills were called on in an increasingly diverse number of areas. Notable examples include work on city heating projects, manure fermenters, and even the world’s tallest Ferris Wheel. As a further extension of the company’s scope, Powerspex has been working for Damen Dredging Equipment (DDE) since 2006. “We work on Damen’s Cutter Suction Dredgers – providing the hardware and software engineering, instrumentation, cabling, installation and calibration and final commissioning,” says Hardware Engineer Bart Zijpvedl. “And then, after delivery, we are involved with spare parts and servicing, which can be on location, but which is becoming more and more via remote access. In the beginning we worked on just a couple of vessels per year, but this has increased significantly. Problems are solved faster – meaning less time spent away from the work site to solve the problem. Striving to develop automation software even further, Mr Brouwer has clear goals for the future: “Our aim is to be able to generate more detailed reports, ones that prepare the specific problem – to which we can then present the specific solution.” He also utilises Quality Improvement Reports to address feedback from clients. “To this end, we are paying more attention to automated dredging. After all, a vessel captain cannot work for twelve hours straight, so we are working on systems that can take over functions such as swing speed and depth in addition to cutter head positioning.”

Evolution of dredging

Another key member of the Powerspex team working for Damen is Software & Commissioning Engineer Remon Brouwer. He has been developing the software used on Damen’s CSUs for more than a decade, and as such is in a good position to comment on trends in the dredging sector. “You cannot really compare the CSUs that were built 10 years ago to the ones built today,” he notes. “There has been so much development in that time. The diagnostic capabilities and attention to service has improved significantly. Problems are solved faster – meaning less downtime and less costs for the operator.” Facilitating this remote servicing is a webpage installed into every vessel’s CPU (Central Processing Unit). This provides information to create and monitor status reports as well as any potential alarms. Many issues can often be solved remotely, and if not, a field engineer can be deployed to the work site to solve the problem.

High standards

Under the contract, Damen is delivering a turnkey package that includes engineering, procurement and support. This includes the change of engines, the installation of onboard LNG storage facilities, and maintenance support for eight years. The Samul de Champlain was built in 2002 and is the largest vessel in the GIE Dredging-Ports fleet. Based in the Grand Maritime Port of Nantes-Saint-Nazaire, she divides her time between the Loire and Seine estuaries. Her current propulsion system is diesel-electric, burning relatively clean MGO, and the retrofit will give her dual-fuel MGO/LNG operability. With the Samul de Champlain’s struggle through her life and in need of new engines, Jean-Pierre Guéllé and his team at GIE Dredging-Ports see an opportunity. “With the vessel needing major work anyway, it makes sense for us to do everything we can to cut operating costs and improve its environmental profile,” said Jean Pierre Guéllé. “If at the same time we set a positive example to the maritime sector by becoming the first operator in France of an LNG-powered vessel, aside from LNG carriers, that is an added bonus.”

Operating on LNG will allow GIE Dredging-Ports to fulfill its mission of optimizing costs via lower fuel bill and exhaust gas maintenance, and at the same time delivering greatly reduced emissions of CO2, NOx and particulate matter above and beyond current standards, a responsibility that GIE Dredging-Ports takes very seriously.

The project

The conversion work involves modifications to the internal structure to allow the installation of two, Type C LNG tanks on the hopper deck. Thereafter the three existing diesel engines, plus the injection equipment to fluidise the solid sediment layer into a density current, thereby creating a mixture of water and sand. This mixture is then sucked through the hydraulic system and serves as a replacement for thepropulsion system of the vessel. Under the programme agreed, INEA is suppling 50% of the €20 million budget, making it financially viable for GIE Dredging-Ports. France is not as advanced as some countries in its exploration of the potential of LNG for maritime propulsion with no bunkering vessels currently in operation, and dredgers are ideal vessels for demonstrating the advantages of dual-fuel propulsion. “The power requirements of dredgers vary greatly as they go about their operations,” explained Hubert Louys, Project Manager at GIE Dredging-Ports. “They range from needing to operate from the site of operations to sudden manoeuvring and periods when they make require a lot of power as they push into strong currents while at the same time operating their dredging pumps and other equipment. However, we are optimistic that the converted Samul de Champlain will be able to operate close to 100% on LNG, even in such conditions, with the MGO option available for extreme situations.”

The dredge will be used for a variety of tasks, from maintaining the English Channel to clearing the sediments from the Adriatic Sea. In addition to providing the necessary power for the vessels, the LNG will also be used for heating and cooking purposes on board, as well as being sold to local authorities in the vicinity of the port. The conversion of the TSHD is expected to be completed by the end of 2020, with the new vessel set to enter service in early 2021. The project is set to be a significant step forward in the transition to cleaner and more sustainable maritime transport, and it is expected that other dredging companies will follow suit in the coming years.

This summer saw another milestone in the drive towards cleaner shipping in European waters. In July, GIE Dredging-Ports awarded the contract for the retrofittion of the Trailtng Suction Hopper Dredger Samuel de Champlain with dual-fuel engines and the associated systems that will make it capable of being powered using LNG. The winner of the tender process was Damen Shiprepair & Conversion with the work to take place at either Damen Shiprepair Brest or Damen Shiprepair Dunkerque. The vessel will be the first in Europe that a dredger has been retrofitted with LNG capability, and the work is part of an EU-supported initiative to promote LNG propulsion in short sea vessels operating along the European Atlantic coast.

GIE Dredging-Ports is an economic interest group created in 1979 to optimise the costs of maritime dredging at six key ports serving the French Atlantic coast plus Marseille in the Mediterranean. It is 50% owned by the French State with the remaining 50% split between the seven Grand Ports Maritimes of Dunkerque, Le Havre, Rouen, Nantes-Saint-Nazaire, La Rochelle, Bordeaux and Marseille. Headquarters in Rouen, it owns and manages a fleet of seven dredgers ranging in size from the 52-metres, 450m³ La Maquina up to the 117 metre, 850m³ Samuel de Champlain. Each port charters the dredgers from GIE Dredging-Ports according to its needs and is responsible for operating them and supplying all their own crew.

The Samul de Champlain has a range of applications, from port maintenance to the construction of new harbours. It is equipped with the latest technology, including a fully integrated command & control system that allows remote operation of the vessel. The vessel is also fitted with state-of-the art environmental monitoring equipment, including sensors to measure emissions and water quality. The retrofitting work includes the modification of the vessel’s machinery and the installation of new propulsion systems, allowing it to be powered by LNG. This will significantly reduce the vessel’s carbon footprint, making it a more environmentally friendly option for coastal and port maintenance operations. The conversion work is expected to be completed by the end of 2020, with the new vessel set to enter service in early 2021. The project is set to be a significant step forward in the transition to cleaner and more sustainable maritime transport, and it is expected that other dredging companies will follow suit in the coming years. The conversion of the SAMUEL DE CHAMPLAIN TO BE CONVERTED TO LNG IN A EUROPEAN FIRST

TSHD SAMUEL DE CHAMPLAIN
TO BE CONVERTED TO LNG IN A EUROPEAN FIRST

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The project

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The works

The conversion work involves modifications to the internal structure to allow the installation of two, Type C LNG tanks on the hopper deck. Thereafter the three existing diesel engines, plus one and auxiliary, will be replaced with dual-fuel engines. At the same time, the electrical distribution, command & control and security systems will also be upgraded. The machinery spaces, the cooling systems and various piping will also require extensive modifications. In the fourth quarter of 2017 studies are underway and equipment under order. The conversion is scheduled to be completed in December 2018 at either Damen Shiprepair Brest or Damen Shiprepair Dunkerque. We are already looking ahead to our next project in cooperation with the Grand Port Maritime of Bordeaux,” concludes Jean-Pierre Guéllé. “We have a tender now out for the replacement of the grab dredger La Maquina in 2019. The new vessel will use water injection equipment to fluidise the solid/sediment layer into a density current, thereby allowing the material to flow out of the port basin with the current. The new acquisition will also be dual-fuel powered, using LNG and MGO.”

For more information on the S/F SamulNG for a Blue Atlantic Arch project, visit www.samulng.eu.
On 22 September 2017 Damen Shipyards Group signed a contract with LLC ‘Onego Shipyard’ to build a Trailing Suction Hopper Dredger (TSHD) 2000. The yard, based in Petrozavodsk, Russia, will construct the vessel for Rosmorport, the Russian Port Agency FSUE. 

Upon delivery – due in 2019 – Rosmorport will have six Damen dredgers operating in its fleet, as well as a number of Damen workboats. The other dredgers are a CSD 650, three TSHDs 1000 and another TSHD 2000, the Severniya Dvina.

The Severniya Dvina was delivered to Rosmorport last year and is the sister vessel of the TSHD now under construction. The Severniya Dvina was the first TSHD to be built under Russian Maritime Register of Shipping (RMRS) supervision in 30 years. Both TSHDs are required to operate in Russia’s Northern Region, maintaining navigation channels. To ensure their suitability for operating in the region – where air temperatures can vary between -40 degree C and -30 degree C – Damen, in close consultation with the client, has tailored the design of its standardised TSHD 2000. Included in the customisation of the TSHDs is a reinforced bow with C211 notation, which enables the dredgers to operate in ice approaching freezing point.

Like the Severniya Dvina, the new TSHD will be outfitted with a complete Damen Dredging Equipment dredge and instrumentation package. This ensures the dredger’s efficiency in operation and ease of maintenance. The package includes a 600 mm trailing pipe and hydraulic winches, a low pressure Damen inward dredge pump for the most efficient hopper loading process, telescopic overflow and 5 rod-actuated bottom doors. Key specifications for the Damen TSHD 2000 include a Hopper capacity of 2,000 m3, a length overall of 80.35 metres, a beam of 16.2 metres and a dredging draught of 5.1 metres. Trailing dredging depth: -22 metres. The vessel offers accommodation for 12 crew.

The latest vessel will be further tailored. Damen has been in close contact with Rosmorport to identify additional requirements for the new vessel – included in this is a self-emptying system for box discharge. Damen Sales Manager Marc Tijssen explains Damen’s approach to customising its standard designs, offering its clients of combination of proven technology and flexibility: “We can always accommodate client modifications to our vessel designs. After all, our clients have the operational experience in their particular working environment. We use that valuable information to optimise our designs in order to meet those specific needs.”

Damen has a lot of experience with providing support for the building of its vessels at non-Damen yards. The Severniya Dvina was built at the Song Thu Shipyard in Vietnam. Damen will provide support for the construction of the new dredger, as Mr Tijssen explains: “In this particular case, we will provide the design and materials package to Onego Shipyard. And, because transfer of knowledge and technology is a key aspect of the DTC formula, we will also be ready to deliver any assistance during the build process.”

Speaking of the relationship between Damen and the client and partner yard, Mr Tijssen says, “We are extremely proud of how our business relationship with Rosmorport and Onego Shipyard has grown over the years,” notes Mr Tijssen. “And of course we are looking forward to forming closer working ties with Onego Shipyard in the near future.”

Van Oord is nearing completion of the Provara channel connecting the Tengiz oil fields in Kazakhstan to the Caspian Sea. To support this substantial project, the company deployed numerous types of vessels such as work pontoons, crew suppliers, backhoe dredgers, dredge support vessels as well as four Cutter Suction Dredgers – two of which were the Ural River and Mangystau; the first two standard CSD650 vessels built by Damen.

Construction of the 72-km long Provara channel was required to provide crucial sea access for the transport of construction modules for the expansion of existing oil production facilities. “The task of Ural River and Mangystau was to make the first – and, appropriately – out of the channel,” explains Van Oord’s Manager Plant Department Stefan Hansum. “We had two additional CSDs following behind to dredge even deeper.”

Seasonal limits
delivered on time and on budget, the three-year Provara channel project had its own set of challenges. “The north-eastern part of the Caspian sea is very remote. In particular, the Provara region is very difficult to reach, with very little infrastructure or amenities,” continues Mr Hansum. This inaccessibility, in combination with the seasonal extremes experienced in the area, meant that well planned logistics were paramount. “Dredging was only possible between April and October – meaning that our vessels, equipment and crew needlessly return back to the base (in the port of Baku) before the winter ice made dredging operations impossible. This made it necessary to plan well ahead. Because of the climate, deadlines could not be missed.”

Fine-tuning the design
Working within such tight schedules, the project team was keen to optimise both productivity and safety wherever possible. In this respect, the fact that the Ural River was delivered before the Mangystau meant Van Oord could specify a number of additional modifications: “We had some ‘lessons learnt’ with the Ural River,” he notes. “These were on technical and operational levels, but also concerning safety. For example, a CSD of this size doesn’t normally have a cutter platform from where you can work safely in front of the cutter head.” After discussing this issue during a visit to Damen Dredging Equipment (DDE) in Nijkerk, the Netherlands, Mr Hansum provided the DDE team with a hand-drawn sketch of his design request. “On the basis of that sketch Damen made the basic engineering, from which we produced the detailed engineering.” To address other aspects of the project-specific scope, other modifications included the installation of additional railings, hand grips and another type of deck crane, as well as repositioning the winches to optimise operations.

Environmental sensitivity
Another pertinent factor about this project was an effective environmental impact assessment, as the Provara region is home to numerous endangered species of flora and fauna. In response to this, Van Oord cooperated closely with independent wildlife observers in order to minimise the impact on the environment. This increased attention to the sensitive local conditions also resulted in various vessel modifications: “This focused on minimising the risks and consequences of leaks – so we added drip trays and dry break couplings to the bunker connections and shut-off valves to the hydraulic connections so that, in case of a leak, we could shut off the system immediately. On an operational level, the crew also minimised their use of grease on board by means of an automated greasing system.”

Now that the Provara channel project is nearly complete, how does Mr Hansum judge the vessels’ performance? “We did have some teething problems with the Ural River, which can be expected with the first standard CSD650 that Damen has built. But the cooperation that we had with them to solve these issues was fine. Generally speaking, these two CSDs display all the characteristics that we want in a vessel: safe, environmentally friendly, reliable, productive and highly automated. And from the point of view of the crew, they were happy with how user-friendly these vessels were.”

Van Oord’s fleet working on the Provara channel also included:
- Three Fast Crew Suppliers 1650; for transfers of up to 23 passengers with a top speed of 15 knots.
- One Modular Multi Cat 2212; for dredge support duties.

Roms Morport Orders Sixth Damen Dredger

Caspian Sea Sisters
A Project Report from Van Oord’s Two Damen Cutter Suction Dredgers 650

An industry in growth
Kazakhstan’s oil industry is significant to both its own economy and the global oil supply. The country has over 150 oil fields, of which the Tengiz field is one of the largest. The 72-km Prorva channel – built for TenizService – will facilitate an increase in oil production of approximately 12 million tonnes per year.

Supportive duties
In addition to the two CSD 650s Ural River and Mangystau, the Damen contingent of Van Oord’s fleet working on the Provara channel also included:
- Three Fast Crew Suppliers 1650; for transfers of up to 23 passengers with a top speed of 15 knots.
- One Modular Multi Cat 2212; for dredge support duties.
CEDA MEETING ON SMALL SCALE DREDGING HELD AT DAMEN DREDGING EQUIPMENT

On Thursday, 28th of September, a meeting was held by the Central Dredging Association at the Damen Dredging Equipment’s (DDE) yard in Nijkerk, the Netherlands. The focus of the event was on small scale dredging.

Mr J.G.S. Pennekamp, CEDA chairman and host of the event, welcomed a crowd of dredging professionals, including contractors, civil engineers, consultants, civil servants and dredge and component manufacturers. During the evening Mr Oliver Marcus, Product Director of DDE delivered a presentation on the many tools available to tackle small scale dredging projects.

The meeting included a tour of the DDE yard, the dredging expertise centre of the Damen Shipyards Group. At the yard, a wide array of dredgers and dredging equipment was on display, including cutter suction dredgers and DOP submersible dredge pumps.

The successful networking event focused on innovations and challenges faced by this section of the industry.

VAMOS ON TRIAL

VAMOS, the viable alternative mine operating system, has reached an advanced stage of project development. All the equipment has been assembled and is currently undergoing trial at an abandoned mining location in the British Isles.

The VAMOS team have identified a number of sites that show suitability for testing the equipment. The first test site is a flooded kaolin mine at Whitehall Yeo pit, Lee Moor, Devon. The site has kindly been offered for use by Imerys. The kaolin, used in many industrial applications, is a decomposed form of granite. The presence of granite at the site posed cutting challenges, but these proved to be no problem for the slurry system Damen had provided, in terms of both production and wear resistance.

The project, funded by the European Union’s Horizon 2020 research and innovation programme, has brought together a consortium of 17 partners from across Europe to design and build a robotic, underwater mining prototype with associated launch and recovery equipment. The equipment will be used to explore and rehabilitate abandoned and underexploited mineral deposits throughout Europe.

Damen’s role in the project is the supply of slurry circuitry components and the launch and recovery system. The launch and recovery system is based on Damen’s modular pontoons – selected for the project for their sturdy, standardised design and ease of transportation and assembly.

The next tests will take place in Bosnia-Herzegovina next year.

DREDGE PUMPS: DRESSING FOR SUCCESS

Up to now, fitting a dredge pump with a second outer pump casing has meant a huge, heavy steel cover. However, pioneering research by Damen R&D engineers has resulted in a patented pump cover that can be zipped onto a dredge pump effortlessly.

The new DynaCover is made of finely woven super strong Dyneema fibres, which can be mounted around any existing cast pump casing at 10% the weight of a similar steel casing. Moreover, the limited size of the cover results in a lower position of the entire dredge pump, which is favourable for the dredge pump’s suction properties. Around the Dyneema cover, a NOMEX outer cover is zipped. The innovative zip design not only ensures simple mounting, but also acts as detector for a burst inner pump casing.

Dyneema fibre is also used for making robust protective equipment. The technology for these super fibres comes from Proteq – a company specialised in the production of bulletproof vests. The advantages of this man-made material are many and varied, with inert material and therefore seawater proof and fully recyclable.