Sharing Knowledge
In recent years, many articles have been written at DESMI in order to share our knowledge with colleagues, customers, business partners, and media around the world.

It is no surprise that after more than +180 years of business, we possess wide knowledge of pumps, pumping and oil spill response solutions. Knowledge that sometimes remains inside the minds of our colleagues and doesn’t get shared.

At DESMI, our knowledge is no secret. We want to share our many years of experience, we want to pass on knowledge about how to handle various media and benefit from using the right equipment. Therefore, sharing doesn’t stop here. There is a goldmine of knowledge and knowhow at DESMI and more knowledge will be shared in the future.

We have gathered some of the many articles that have been written so far. When you have time in your busy calendar, I recommend that you spend it on reading the articles – which also give you an idea of the many applications that our solutions can be used for – and why it is important to pass on this knowledge to the future customer.

I hope you will take inspiration from reading the articles - and if your head is full of case stories and knowledge to share, please remember this quote:

Knowledge alone is not power. The sharing of our knowledge is when knowledge becomes powerful.

Happy reading.

Karina Poulsen
Marketing Manager
A strong track record of providing pump solutions for the defence industry gives DESMI a deep understanding of naval applications – and the Danish-based supplier has everything it takes to meet complex naval needs.

COMMERCIAL BENEFITS – TRANSFORMED
Most navies know DESMI as an established maritime brand, serving the commercial shipping industry for many years. Commercial shipping is a tough, demanding environment with little room for poor quality or design errors. Large container ships, for example, go on voyages lasting up to five years, making sturdy and reliable pump solutions absolutely critical.

It’s this depth of experience that enables the Danish-based company to adapt its well-proven products and technologies to meet the even tougher demands of naval operations.

TRUSTING PARTNERSHIP
Martin Bro, DESMI’s Defence and Fuel segment director, knows just how important it is to do things right. “DESMI and its navy customers share a common goal: that of bringing sailors back to shore safely and helping to make working on board as smooth and efficient as possible. Key to this is the ability to analyse specifications throughout the entire process, delivering the best possible system and aiming for high operational uptime and reliability.”

Much of DESMI’s success results from the collaborative relationships it typically establishes with customers. This partnership approach creates the trust necessary to probe into the needs of the fleet and constructively challenge product or configuration choices – often discovering innovative alternatives that may not have been previously considered.

TRAINING FOR SUCCESS
It can be a struggle for navies to provide their personnel with expertise that extends beyond the instruction manuals of onboard equipment. Helicopter refueling, for example, is certainly more involved than simply pushing a green button!

To meet this need, DESMI solutions often include crew training, giving naval personnel the technical know-how and confidence to operate the equipment effectively. Depending on the solution, training can span two to four days and focus on relevant health and safety aspects, too. At the end of the training, operating skills are carefully tested – leaving no doubt that the necessary competencies are in place.

TAILORED TO NAVY SPECS
Navies operate in extreme conditions – a typical day could mean freezing rain, rapid accelerations, huge temperature swings, intense salt fog, or even gunfire vibration. And navy ships need pumping systems that are up to the task. DESMI’s shock-rated pumps, for example, have the durability to weather the most challenging environments – and DESMI’s people have the know-how to recommend the best solutions.

A dedicated team works closely with navy customers to customise off-the-shelf commercial products, transforming them with specialised materials and features to deliver the ideal fit. By adapting their standard range to Military Off The Shelf (MOTS) equipment, DESMI provides navy customers with cost-effective, reliable pumping solutions – all while addressing their exceptional shock requirements.

DESMI knows that naval applications come with stringent documentation requirements – and ensures that all products live up to these. Beyond supplying standard manuals for DESMI products, the company can provide integrated logistics support and technical drawings, adjusting these as necessary throughout the process and working with shipyards to ensure everything meets the specifications.
PACKAGE DEAL
Today, DESMI supplies not just stand-alone pumps, but fully equipped and optimised systems. For helicopter refueling, for example, the pump is just the beginning of a solution that expands to incorporate pipes, meters, valves and hoses until it becomes a fully configured, purpose-built skid.

In fact, DESMI can go much further than this. Take DESMI OptiSave™, for example, an automated sub-system that optimises pump and fan speeds to meet current requirements – with significant fuel savings as a result.

As Martin Bro explains: “Today, our navy customers are buying fully tested and approved, plug-and-play solutions from a single supplier. And they can choose a comprehensive service plan from us, too.”

SUPPORT THROUGH SERVICE
While many navies take care of their own equipment, DESMI stands ready with a range of service agreements. The company’s service technicians have the necessary security clearances and skills to work aboard naval vessels, and DESMI labs are equipped for additional testing, such as measuring noise vibration, where required.

Proving that innovation extends beyond the pump systems themselves, DESMI technicians sent to service naval vessels typically arrive equipped with specially designed spare parts kits. Each kit has a clearly visible, unique NATO order number, showing precisely which pump type it fits. And every kit contains all the parts necessary for the pump, from O-rings to bearings, shaft seal and more. As a result, repairs can be made more quickly – and ships are less likely to be delayed.

Ready for the next challenge
From shock-rated pumps to helicopter refueling systems and everything in between, DESMI has the confidence to back its products through robust warranties that can be adapted to fit navy requirements. And with a willingness to deliver products that meet exacting requirements and a commitment to building trusting relationships, DESMI will continue to expand its list of naval customers well into the future.
Developing and supplying reliable pumps is only part of the equation for DESMI. State-of-the-art field service gives customers peace of mind, wherever their pumps are installed and whatever the configuration.

**FULL-SERVICE OPTIONS**
DESMI supports pump systems installed at everything from district heating plants to battleships. Differing types of service are available for differing client needs and the deep know-how of the field engineers allows them to maintain competitor brands, too.

If a pump breaks down, the Fix on Failure solution brings in field engineers to overhaul the system and determine if the issue is due to wear or an installation problem. For a more proactive approach, DESMI offers preventative maintenance contracts. These define service intervals to verify that everything is running properly and assess the risk of failure within the next contract period. The condition-based service approach takes proactivity even further, with engineers coming in at shorter intervals and ensuring every time that overall performance is as efficient as possible. These regular visits let DESMI’s engineers monitor the pumps and also check that bearings and other potentially worn parts are operating as expected. Such check-ups ensure that pumps operate at their highest efficiency – and can result in big savings.

**SERVICE THAT PAYS ITS WAY**
Just how much money can be saved? According to Johan Schwerin, DESMI’s Service Manager, “Restoring a loss of perhaps 5 percent in efficiency (with a 55kw motor or larger) can easily pay the cost of a service visit in sheer energy savings.”

DESMI field engineers are usually able to deliver savings on their first site visit - often through some fairly simple adjustments to correct the pump farm not running as efficiently as possible. In fact, the company offers an initial service visit for free because long experience shows that there is almost always potential for optimisation. And there’s often no charge for the first service visit if no improvements can be identified. “We experience more and more often that if there’s a problem with the customer’s installation, it’s not the pump that is at fault,” explains Johan Schwerin. “Instead, the installation may be poorly suited to the pump (or vice versa), or the pump may have been incorrectly installed. Usually, a visit from a service technician can take care of such problems.”

**EXPERTISE IN ACTION**
In a recent case, DESMI received an urgent call for help from a shipbuilding client who had run into a problem installing a number of the vessel’s pumps. The motors on four NSLH (horizontally mounted) pumps needed to be turned 45 degrees to suit the installation. The deadline? ASAP, of course.

Within three hours of the client’s call, a service technician from Denmark was on site - and he was joined shortly after by a DESMI colleague from Germany. By the time the DESMI technicians left the site at 10 pm that evening, the work for all the pumps had been completed and the client was able to install the system as planned.

**DONE RIGHT – RIGHT FROM THE START**
When installing and commissioning a pump or pump system, it’s worth getting a DESMI field engineer on site to help ensure the installation is correct and that the pump gets a
good start. Confirming that a pump system works at its best duty point from the outset maximizes results and means it’s likely to last longer, too. It is particularly important to ensure a correct start for pumps and pump systems to avoid damaging dry runs – especially as the seals are likely to sustain damage from an incorrect start-up. DESMI also performs installation and commissioning for automation, which encompasses frequency inverter filters, complete solutions for control panels, Human Machine Interfaces (HMI) and more. Confirming that the leading current coming from the frequency inverter won’t damage the pump is the first part of an automation project check. From there, DESMI technicians work their way through the entire installation to identify potential performance issues related to piping or other parameters.

FINDING SOLUTIONS BEYOND THE PUMP.
When performing installation checks or conducting service calls, DESMI’s engineers don’t just examine the
pump. They take the widest possible view of the pumping system and its surroundings, allowing them to consider every possibility and address the root cause. Could the problem be the pump’s bearings? Or might it be related to the surroundings? Is a different flywheel required, perhaps? Is head/inlet pressure as expected?

With both preventative and condition-based service, sophisticated vibration analysis helps DESMI technicians discover the truth. So, too, does looking at the factors around or inside the pump. In the end, being able to accurately determine what’s wrong, be it the pump, the piping before or after, or something else entirely, allows DESMI’s field engineers to come up with a solution or adjust the pump’s performance to suit the unique situation and perform to expectations.

**A COMPLETE OVERVIEW**

DESMI’s trained technicians are backed by a sophisticated system that registers all customer equipment – both DESMI-branded and competitor brands – and plans service visits and technical resources. The system decreases the potential for costly repair delays as technicians know if any parts have been installed that differ from the pump’s original specifications and can ensure they bring all necessary parts. It also registers software versions, where relevant, and gives technicians access to all available data about the pumping system and its previous service history. After every service, DESMI’s technicians produce a full report on the condition of the installation and any repairs that may soon be needed. And anything that can immediately be done to increase pump efficiency is also communicated.

**VALUE-ADD**

When a customer purchases a service package either from DESMI or from a competitor, DESMI may offer to hold critical spares in stock. Having these parts on hand at DESMI enables customers to minimise costly downtime by reducing repair time by as much as several weeks. As part of any pump package, DESMI can also offer training in simple maintenance, enabling in-house crew to help keep the pump system running smoothly and efficiently.

**FASTER AND MORE REMOTE**

What does the future hold for DESMI’s pump and automation field services? A key direction for the company is condition monitoring via remote surveillance. To do it, DESMI’s R&D department is exploring an Internet of Things (IoT) approach that permits better monitoring of pump state and efficiency – and enables a service technician to be deployed at the optimal moment.

Today, already, customers can choose to set up remote access to their pump systems, enabling them or DESMI’s own service engineers to monitor for faults and breakdowns from other locations. This capability is becoming more and more popular as pump installations grow in size and complexity – and when customers get a glimpse of the savings achievable in this way.
COMPACTCLEAN

The Most Compact Ballast Water Management System on the Market!

- The Smallest Footprint in Industry
- Filter and UV unit in seawater resistant Nickel-Alu-Bronze
- IMO Type Approval according to the new BWMS code from IMO
- Patent Pending Highly Efficient UV Unit Design
- Short Delivery Time
- Easy Maintenance
- No Salinity or Temperature Limitations
- Down to UV-Transmission of just 42%
  - Also in US Territory!
- 100% Chemical Free Treatment

CompactClean 340 m³/h System

H: 2384 mm
LXW 1878 x 1166 mm

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DESMI OCEAN GUARD’S COMPACTCLEAN BALLAST WATER MANAGEMENT SYSTEM RECEIVES IMO TYPE APPROVAL

Aalborg, DK, 24 September 2018 – DESMI Ocean Guard A/S is pleased to announce that the CompactClean Ballast Water Management System (BWMS) has received IMO Type Approval according to the revised IMO BWMS code. This approval means that the CompactClean BWMS becomes one of only two systems worldwide approved for installation on vessels also after 28 October 2020.

On 21 September 2018 DESMI Ocean Guard’s CompactClean Ballast Water Management System (BWMS) received IMO Type Approval according to the IMO Code for Approval of Ballast Water Management Systems (resolution MEPC.300(72)), also often referred to as the revised G8. The approval was issued by Lloyd’s Register on behalf of the Danish Environmental Agency and the Danish Maritime Authority.

The IMO BWMS Code was adopted in April 2018 and includes more stringent and robust testing and approval requirements than its predecessor. All BWMS installed on ships on or after 28 October 2020 must be approved according to this revised BWMS code. Today only two systems have this approval, which means that the CompactClean BWMS is one of only two BWMS available worldwide that meet the future requirements.

IMO type approval is the first step in the planned approval process for the CompactClean BWMS, which will now continue with the issuance of a Lloyd’s Register Type Approval certificate, and the submission of a full application for US Coast Guard (USCG) Type Approval within a couple of weeks. Furthermore, the CompactClean BWMS is undergoing approval according to ATEX and IECEx requirements for installation in hazardous zones on e.g. oil and chemical tankers, and this approval is expected before the end of 2018.

The IMO Type Approval includes no operational limitations of the system with regard to salinity, temperature or holding time. The CompactClean
The CompactClean BWMS consists of an automatic backflushing filter, a UV unit, valves, sensors, and controls. Furthermore, the system includes many features that are of importance to the daily operation. One example is automatic generation of PDF reports that document all the performed ballast water treatment operations, in a format that is suitable for submission to local port authorities and others. Another example is that the system includes a pump that can be used as stripping pump under ballast stripping operations, thus solving one of the main problems for ballast water management system installations today.

DESMI Ocean Guard A/S develops and markets ballast water treatment systems for the removal of living organisms from ships’ ballast water. DESMI Ocean Guard is wholly owned by DESMI A/S, and its head office is located in Nørresundby, Denmark. DESMI A/S has more than 180 years of history and today the DESMI Group portfolio includes pumps, oil spill response solutions, pumping solutions for defence applications, energy saving systems, automation and contracting activities next to ballast water management systems.
Danish-based manufacturer DESMI has supplied pumps for more than a century. When developing pumps, testing finished products for compliance with guaranteed values, or working with refurbished units, it is essential to run reliable, quality testing at a qualified pump testing facility. The capabilities required by such test beds tend to vary – from straightforward, functional stations to complex test facilities that deliver high precision. DESMI’s latest test bed, completed at the end of 2017 by DESMI Automation, works with extreme accuracy and a wider variety of testing scenarios – and it is enabling DESMI’s customers to tap into a new, expanded set of testing certification services.

HEAVY INVESTMENT
“We’ve made a considerable investment to upgrade our existing test bed with complete, state-of-the-art technology,” said André Jelstrup, Production Manager at DESMI. “With eight different test bases, each equipped to handle pumps of varying sizes and types, we’ve now got far greater flexibility.”

Flexibility isn’t the only advantage of the new facilities. Just as importantly, the new test bed can be both upgraded and expanded down the line. “This is where the real future-proofing comes in,” Jelstrup concludes.

IMPROVED TEST OUTPUT
DESMI’s upgraded test bed technology is a vast improvement in performance testing. Once a pump is secured on its skid, an auto-cycle fills the pump cylinder with liquid, pushes the air out and automatically tests various points on a pre-determined pump curve. All the while, two viewing monitors provide a continuous and complete readout of the test results. Tolerances can also be accurately measured, providing a significantly larger data
set than the previous system. This latter feature can be used to refine designs or catch problems at a much earlier point during testing.

Additionally, the new test bed enables technicians to experiment by up-scaling and down-scaling the power supply, simulating different media viscosities, or changing the number of frequency converters, for example. It also makes it easier to connect customer-provided frequency converters for testing pumps to reflect more accurate operating conditions. The new test bed facility also contains an additional bay where noise and vibration tests can be performed, expanding DESMI’s ability to provide certification services around these issues, as well.

FACILITY OVERHAUL

The upgrade to the DESMI test bed took place by DESMI’s own Automation team over nearly the entire 2017 calendar year. And André Jelstrup is certainly pleased with the result. “It was a great pleasure to execute our plan and be able to roll out the completed facility. The new facility features a modern, fully digitalized system with an entirely new power supply setup, and an expanded range of inputs and outputs. Our equipment standards have been raised, and we are delivering even more accurate readings to our customers.” he states.

REMOTE VIEWING

Looking for ways to move the company’s test bed technology even further forward, the DESMI team has been hard at work to deliver remote viewing of pump testing - in real time. While many customers are able to visit the test bed in person, the option to view testing remotely will likely prove to be of huge benefit for customers around the globe.

“At some point in the future, this will all be live,” says André Jelstrup. “One could literally sit in a café in a seaside village - watching and even perhaps asking the operator for particular parameters, to repeat a test, or even to run specific tests. This is the future of test bed technology and we are now positioned to deliver it.”

SUSTAINABILITY UPSIDE

The upgrade to a more advanced test bed has even helped the DESMI test bed team to deliver on the company’s sustainability agenda by reducing the use of paper. “DESMI test bed staffers used to have to print out all test results in order to read them. Now all results are read, reviewed and archived digitally. We can also produce and distribute certification documentation electronically, faster and more efficiently. As things change, the technology must move with it. Our customers rely upon, and insist on us being able to deliver new capabilities,” André Jelstrup concludes.
DESMI AUTOMATION HAS ITS EYE ON ENERGY EFFICIENCIES

Industrial pump and energy optimisation provider DESMI aims to be the go-to source for customers and companies that hope to solve energy optimisation problems smarter and more cost-effectively via automation.

It’s hard not to be caught up in the enthusiasm of Brian Enevoldsen when he says: “We’re just scratching the surface of what automation technologies can do to help create a more sustainable, more energy-efficient world.” The usually down-to-earth Dane has recently been put in charge of an increasingly important business area at DESMI, a company best known for its high-quality industrial pumps and which serves both land-based and maritime markets around the globe.

DESMI Automation, as Brian Enevoldsen’s division is matter-of-factly called, focuses on providing specialised automation services across all of the company’s business areas. It’s a division that is rapidly emerging as a key offering in DESMI’s broad portfolio – with the potential to extend far beyond traditional pumping applications.

ON A SUSTAINABLE ROLL
“DESMI is expanding with our markets,” says Brian Enevoldsen. “And we can see that our solid track record in automation is likely to be a key driver in this growth in the years to come.”

Much of the growth he describes is being driven by high-priority customer needs for new cost-efficiencies and competitive advantages, as well as steadily increasing pressure on shipping, offshore and industrial companies for a greener, more sustainable profile. And automation is stepping in to help them meet such challenges.

AIMING HIGH
At DESMI, there’s no shortage of ambition for the new automation division. It’s backed, on the one hand, by years of experience in automating energy optimisation and, on the other, by recent investments in expertise and infrastructure to fuel development and delivery. “We want to be regarded by our customers as the best automation supplier in our segment,” says Brian Enevoldsen. “So instead of resting on our successes in the automation field, we’ve embarked on a programme of continuous improvement in services, processes and performance.”

Part of this programme, was the early 2017 acquisition of CSEN, a company whose electrical engineers have all the skills needed to help DESMI design and manufacture a greater number of the components used in its integrated solutions. With more control over...
switchboards, cabling and motor, for example, the company can now automate and optimise every aspect of complete equipment skids – and offer a single point of contact for resolving any technical issues. The acquisition has also brought new capabilities in the fast-growing field of power quality management, too.

OPTIMISING THROUGH AUTOMATION
For Brian Enevoldsen and his newly expanded team, however, it’s the promise of automation that is in focus: “Automation is integral in so many things today – and optimizing energy consumption through automation is one of the most rewarding applications, both for our customers and for our planet.”

While DESMI laid the cornerstone for its automation capabilities in the world of industrial pumps, ensuring they only operate when required and at the actual energy level needed, DESMI Automation has its divisional eye on a bigger picture: “We’re extending our optimisation expertise beyond pumps to a range of other applications where automation can make a difference.”

MARITIME MATTERS
In recent years, the maritime industry has been seeking savings wherever possible. Yet automation has been surprisingly slow to make inroads, with comparatively few ships optimising their energy consumption for pumps and similar systems, despite clear and compelling business cases. Now, however, the push is on not just to save money, but to comply with heightened environmental protection legislation, too. Here, DESMI and its automation division is a hard act to beat, particularly on its home ground of industrial pump systems.

Brian Enevoldsen explains why: “We’re able to make a significant difference because we have a very strong brand in the pump business as a global manufacturer. It’s our DNA, you might say. We know our pumps thoroughly and we’ve had more experience than most with optimising these systems with the help of automation.”

Already, hundreds of Optisave™ systems, for example, have been installed on board vessels of many different types. Optisave™ leverages automation to save energy by providing intelligent control of the ship’s cooling water system. And, with a typical investment payback period as brief as 12 to 15 months, the systems have quickly proved their worth.

TWO-SIDED EQUATION
Going beyond the core business of pumps, ventilation and compressors is nothing new for DESMI’s automation team. The company’s Optipower™ automated solutions are a case in point. Optipower™ manages the quality of power provided to systems to reduce loss within the electrical network, prevent damage from electrical distortion, and ensure that equipment such as transformers and cables is not oversized. All maritime classification societies now have regulations that require power quality to be measured on board ships as of January 1st, 2017. Many shipowners, however, are likely to first discover these requirements when docking – comprising a risk to continued operations. And DESMI Automation stands ready to help them resolve the problem as quickly as possible.
“These days, DESMI views almost every one of these automation projects as a two-sided equation,” says Brian Enevoldsen. “It’s a win for shipowners and for land-based industries deploying automation in this way, and it’s a win in the fight against global warming, too. We’re undeniably proud to be contributing directly to the achievement of the UN’s Sustainable Development Goals in this way – and really, we’ve just beginning this sustainability journey where automated energy optimisation is concerned. Even solar and wind energy applications are in our development searchlight, too.”

AGILE DEVELOPMENT PARTNER

There’s another asset, too, that differentiates DESMI from the larger players in the automation and pumping solution sectors. It’s the flexibility and inherent responsiveness of being a smaller player in the automation field. “We’re better able to think out of the box than some of the largest companies in the marketplace – and quickly act on those thoughts. We want to be the people you call if you have a good idea for a green solution where automation could play a role, and you need a partner to turn that idea into reality. We’ve got all the skills, and are keen to participate in joint developments across many different industries and applications.”

SUCCESS FACTORS

One particular factor must be present in all DESMI Automation solutions: high quality. It’s a core component of the DESMI brand, and part of what has built the company’s success to date. “We’re flexible in what we can develop with our customers and business partners, and in the way we bring solutions to market, but quality is non-negotiable at DESMI,” says Brian Enevoldsen. “And that’s the key reason that there’s no doubt in my mind DESMI Automation will get the chance to bring value to many different spheres where our skills and technology can make a worthwhile difference.”
“Water, water everywhere, but not a drop to drink”. The line made famous by poet Samuel Taylor Coleridge provides a good description of the world’s water supply situation. And his words have perhaps never been more relevant than today.

Around 70 percent of our planet’s surface is covered by sea water. Estimates vary, but the oceans contain about 1.5 quintillion (1,500,000,000,000,000,000) tons of the life-giving liquid – and there’s a lot more circulating in the air, in the ground and in our bodies. So you might imagine that providing sufficient water for the world’s population to survive and prosper isn’t much of a challenge.

The problem is, however, that some 98 percent of the planet’s water is salty. And of the remaining fresh water, only a relatively small proportion is readily available to use as drinking water or to supply other consumer, production or agricultural needs (lakes and rivers, for example, contain only around 0.035 percent of the planet’s total water supply). To make matters worse, the pressures of climate change, population growth and increasing affluence are placing a heavy, growing burden on fresh water supplies.

More and more, therefore, the world’s local authorities, and industrial or agricultural producers are turning to sea water as a source. But going from salty to fresh water isn’t quite that easy.

**DESLINATION IN FOCUS**

Desalination is the process of producing drinking water and service water from seawater. It’s a process that doesn’t vary much around the world: Sea water is pumped from coastal inlet pipes, processed under high pressure through filters, then pumped onward, typically to reservoirs dotted around the landscape. Torben Harlev Mai is an Application Manager at Denmark-based pump system manufacturer DESMI. DESMI provides industrial pumps for a wide variety of applications including desalination, with different models and capacities for water purification systems or reverse osmosis (RO) treatment.

With more than 100 years in the field, DESMI centrifugal pumps have carved out a reputation around the world for high reliability, low maintenance costs and low NPSH (net positive suction head) values. The powerful DESMI DSL double suction pump, for example, is ideally suited to seawater intake – and the company has a full range of pumps for brine, recirculation, backwash and transfer.

**EFFICIENCY FIRST**

“It’s absolutely crucial to use highly efficient pumps at each stage of the desalination process,” says Torben. “That’s because it is very expensive to make water in this way. By comparison, pumping up and purifying groundwater uses around 2.7 kWh of electricity per cubic meter. But for desalination, it’s 5 to 6 kWh - or double the energy consumption. And that’s not good for operating costs or for the environment.” Efficiency isn’t the only parameter, however. The salt content of sea water and its varying temperatures around the earth aren’t exactly friendly toward man-made equipment. But supplying pump solutions to the maritime industry as its primary business area, DESMI is an expert at dealing with such challenges.

“You simply can’t afford to have downtime in an offshore environment,” explains Torben. “Particularly if we’re talking about a pumping system for cooling a ship’s engines. And it’s the same basic pump that we adapt to work dependably in a desalination plant.”

In fact, most of DESMI’s pumps and related equipment is built to handle
even harsher conditions, transferring, for example, heated bitumen or highly abrasive chemicals. For sea water being transferred at temperatures below 15 °C (59 °F), cast iron is used for the pump’s casing. From 15 to 40°C (59-104 °F), nickel alloy is needed. And for pumping sea water at 40 to 60°C (104 to 122 °F) in the Middle East, nickel alloy bronze or super duplex is demanded.

DESMI’s expertise is especially demanded at the higher end of pump dependability, which explains why the Middle East is an important and fast-growing market for its solutions.

**RESEARCH AND DEVELOPMENT**

The Danish-based manufacturer, whose subsidiaries and distribution network stretch around the globe, is big on research and development, too. So, while it offers a wide range of standard pumps as a starting point, a growing number of orders are customised to meet specific customer requests. At the same time, DESMI welcomes new ideas in the desalination field that can help to alleviate approaching water shortages. And, in recent years, plenty of ideas have surfaced – some short-lived, others holding the promise of better technology in the not-too-distant future.

“A lot of smaller companies and university research teams are working on other approaches to desalination,” says Torben. “One idea, called ‘vapor compression desalination’, involves spraying salt water at high pressure into a heated, voluminous space, then collecting the vapor. This delivers high-quality potable water, but not in the quantities required to supply the needs of even a smaller city. And this is the essential problem with practically all alternatives to traditional desalination techniques: insufficient flow capacity.”

DESMI pump systems are available to power new solutions, and the company monitors or participates in attempts to arrive at workable,
Torben is well aware of the issues DESMI is helping to solve: “Fresh, clean water supply is an extreme challenge for the world. This has, of course, been known for quite some time, but the situation in Cape Town, South Africa, in the beginning of 2018 shows how big a problem the populations of many different regions of the world may be facing. Answering this challenge, in part, is up to companies like our own that can supply efficient, reliable pumps as key components of the many new desalination plants that need to be planned and commissioned with as little delay as possible.”

For now, DESMI is best able to help by providing its solutions, along with information and advice on pump choices for such plants, and by maintaining the high reliability its pumps are known for – because unscheduled downtime, when it comes to providing fresh water to large populations, could cost lives. “Our office in Dubai is helping the engineers who advise Middle-Eastern utilities and manufacturing companies on water desalination issues to determine the best setup for new investments – discussing pump applications, types, capacities and servicing plans to keep the flow strong and plentiful. The same goes for our offices in China, Singapore, Africa, Denmark etc. Wherever we can help with our competences within desalination – we take part”.

“In 1995, World Bank vice president Ismail Serageldin declared that the wars of the next century will be about water” says Torben. “Hopefully, that’s not the case, of course. But if we can do anything more to change the future for the better, we will.”
DESMI ADDS ACCREDITED OIL SPILL RESPONSE TRAINING

Leading oil recovery solution manufacturer DESMI has obtained Nautical Institute accreditation for its IMO Oil Pollution Preparedness and Response (OPRC) training courses, becoming a one-stop shop for its customers around the world.

In many spheres of education, it’s enough for course instructors to have a theoretical understanding of the field. In oil spill response, however, DESMI isn’t taking chances, putting experienced operatives into its classrooms to ensure trainees make all the right moves. “Nothing’s quite as informative or as memorable as having someone share real life experiences about what responding to an oil spill is really like – working to contain the 2010 Gulf of Mexico spill, for example,” says DESMI’s Wayne O’Brien, Vice President of Sales at the Danish-based company’s Asian-Pacific organisation. “And with something that is as important, as challenging and dynamic as a large oil spill, lessons learned in the classroom need to remain as sharp in participants’ minds as possible.”

ALL-IN-ONE PACKAGE

An industry veteran with more than 20 years of experience, he is keen to see oil spill response skills boosted, reducing risk to the environment and the impacts on communities affected as a result. O’Brien points to DESMI’s newly accredited IMO OPRC training courses, led by instructors with lengthy, hands-on experience, as the best way to check all the boxes. The accreditation, received in March this year, allows customers of DESMI’s oil spill response solutions to obtain fully compliant training directly from the manufacturer. And O’Brien sees many advantages in being a one-stop source of systems and know-how for the company’s customer base.

“There are, of course, differences between equipment types, meaning it’s almost always best to train with the type of equipment your people will use,” he explains. “Then there’s the know-how aspect. Situations can occur out there that simply aren’t covered in instruction manuals – and you may have to come up with creative solutions to a problem no one has ever encountered before. That’s when experience counts, and when the course instructor’s track record and expertise can make a real difference.”

EXPERIENCE MAKES THE DIFFERENCE

The know-how necessary for effectively responding to oil spills is a lot about people’s experience and expertise. But it also concerns the design and development of the response system itself. DESMI’s Ro-clean equipment has been used in all the major oil spill response operations around the world – and hard-won learnings from responding to such incidents have been continually applied to developing new technologies and fine-tuning existing systems. This proactive approach

[Image of a classroom setting with a teacher at the front and students seated at long tables, engaged in a training session.]
has, for example, led to improved deployment times and a reduction in the number of vessels needed for offshore operations.

**TRAINING AT ALL LEVELS**

Spills can occur at any time, in any location and each with its own unique set of challenges. Contrary to what many people think, large spills do not occur that often. Being able to tap into equipment knowledge and response experience gained at the ‘coal face’ provides a unique opportunity for training participants to learn from the experiences of others without encountering the pitfalls. DESMI’s accredited training programme covers many different needs. In accordance with the accreditation, courses are conducted for operational staff, supervisors and senior managers, respectively.

Operational staff are instructed in understanding the weathering process of oil in the marine environment, how to select appropriate equipment, implement efficient and effective operations using different response strategies, and participate in oil spill response teams at the site. Course participants at supervisory levels learn to safely and efficiently respond to oil spills, undertake initial risk assessments and initiate a response to a spill.

The training also covers how to identify priorities for protection, determine the correct response strategy, identify the limitations of response options and equipment, and understand the needs of the media. At the upper end of the scale, participants receive instruction on the complexities of oil spill management, learning to consider the political and media pressures, legal and financial implications, as well as issues of public and response personnel safety, and post-operational requirements.

**CLOSER TO CUSTOMERS**

While DESMI’s Odense office will remain the company’s primary centre for the delivery of training, the intention is for the majority of training in future to be delivered to customers close to their areas of operation. For now, DESMI customers are lining up to attend the courses in Denmark, prioritising investments in accredited, direct-from-the-source training that can ensure fast and accurate responses to contain not just the oil itself, but negative effects on their companies across the board, too.
Marine and aquatic debris is one of the most widespread solvable pollution problems, plaguing oceans, rivers and lakes around the globe. DESMI is applying its expert knowledge and lengthy track record in oil spill recovery to tackle the issue.

GLOBAL-SCALE PROBLEMS
‘Marine and aquatic debris or litter’ refers to human-created waste deliberately or accidentally been released in a lake, sea, ocean or waterway. It’s a growing global problem that impacts heavily on marine life as well as human health and life quality. In fact, as much as 10 percent of the world’s plastic waste alone ends up in the ocean, much of it non-biodegradable. But there is hope at hand – and DESMI, a Danish-based, global company specialised in the development and manufacture of pump and oil spill response solutions, is looking to strengthen both technologies and partnerships to tackle the problem.

FROM WASTE TO ENERGY
Although the volume and spread of the marine and aquatic debris may seem overwhelming, it can be collected and used as an energy source, and DESMI’s solutions contribute to making this increasingly viable. With the right equipment and know-how, and by establishing close partnerships with local governments, there is an immense opportunity to make a significant difference in the waste-to-energy value chain.

From clean-up operations in the jungles of South America to ocean waters, DESMI equipment provides effective, innovative solutions for the first step of the waste management chain. Specifically, the company develops and markets mobile and stationary clean-up units, high-volume debris trawling devices, floating ‘trash bins’ and other clean-up equipment. Much of this equipment is inspired by decades of leading the field of oil spill recovery – an equally challenging problem in marine environments.

CIRCULAR ECONOMY
While collecting and gathering debris and waste is a good start, invested resources may be futile if the debris is not disposed of properly. If, for example, debris is collected in a pile on shore and a storm follows, it may quickly return to the ecosystem. And badly managed landfill sites, for example, build up toxic substances and attract vermin, posing significant health risks. It is, therefore, essential to identify end-to-end solutions to effectively remove the problem as a threat to the environment, supporting a circular economy. And DESMI provides, therefore, both know-how and technologies for one vital part of this circle.

According to Henrik Knudsen, CEO at DESMI’s Ro-Clean subsidiary, establishing local partnerships is key to addressing collection, transportation, and recycling or the safe disposal of non-recyclable waste: “Based on expertise and capabilities gained in the oil spill industry over many years, we saw an opportunity to contribute to solving this global problem, which is now at the top of UN, regional and local government agendas.”

SUSTAINABLE GOALS
Perhaps the most prominent of the agendas he refers to is the 17 UN Sustainable Development Goals (SDGs). By working to remove marine and aquatic debris as a problem, DESMI is primarily contributing to the achievement of goals 12 to 15 (See the SDG fact box). Others of the goals are indirectly impacted, too, such as the aims of creating sustainable cities and
communities, and providing affordable and clean energy.

Additionally, local communities working with DESMI will also gain decent work and economic growth by creating further local collection and disposal jobs, many of which only require basic training. In fact, countries such as Indonesia and Malaysia already have a so-called “collector workforce” active, for example, in the collection of plastic bottles. Building and structuring the process of collection, transportation and disposal of the waste would expand this employment system. And it would create the need for additional academic and administrative resources, too.

Another important UN SDG addressed by DESMI’s solutions promotes good health and well-being: known as SDG 3. One aspect of this is the viruses carried by mosquitoes, including the Zika virus, dengue and yellow fever, all of which have been described as public health catastrophes. Infectious mosquitoes tend to live in waste such as tires, cans and plastic containers – unnatural environments created by humans.

Removing and disposing of such waste from the environment would, therefore, benefit the health and well-being of entire communities, and potentially wipe out serious health risks.

**CHALLENGING ENVIRONMENTS**

Every environment is different, which can be a serious challenge when it comes to waste removal, as Henrik Knudsen emphasises: “No two riverbeds are the same, for example. Some have a rock bottom, some have a sandy bottom, and sometimes you’re in the middle of a swamp.” Each environment demands something slightly – or completely – different of equipment, operators and partnerships. At times, it is possible to use heavy equipment. Other times, where roads or accessibility can’t support heavier machines, the use of flotation aids is more appropriate.

Here, DESMI’s expertise in identifying project needs and subsequently providing solutions to suit available budgets comes in useful, informed by the company’s work with similar projects in remote parts of the world.

**MOVING FORWARD**

With a comprehensive understanding of marine and aquatic environments, and the ability to provide a range of proven equipment, DESMI is well positioned to partner with local governments and businesses to determine the best possible solution. And the company is actively encouraging potential project owners and participants begin dialogue for a better future together.

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**DESMI TRASH TRAP**

Floating debris, municipal trash and plastic articles are an ongoing blemish on the environment. Much of this material finds its way into streams, rivers, canals, and ultimately into our oceans. A simple solution to this is the DESMI TRASH TRAP. In conjunction with our superior fence containment booms, the floating unit serves to contain much of the floating surface debris while allowing smaller particles and most naturally occurring materials suspended in the watercolumn to pass through. The unit floats on the surface of the water, rising and falling with tides and runoff. The containment guide booms can be positioned to deflect materials from literally any part of the stream. Maintenance consists of periodically lifting the debris basket out of the trap and dumping of its content for sorting or disposal.

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**SUPPORTING GLOBAL GOALS**

On 1 January 2016, the UN’s 17 Sustainable Development Goals (SDGs) were officially launched. While the SDGs are not legally binding, governments are expected to take ownership and establish frameworks for the achievement of the 17 goals. With its marine and aquatic debris solutions, DESMI is particularly focused on SDGs 12 to 15.

**SDG 12 – Responsible Consumption and Production**

Ensure sustainable consumption and production patterns

**SDG 13 – Climate Action**

Take urgent action to combat climate change and its impacts

**SDG 14 – Life Below Water**

Conserve and sustainably use the oceans, seas and marine resources

**SDG 15 – Life on Land**

Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss
NEW EFFICIENCIES FOR SINGLE-VESSEL OIL SPILL RECOVERY

DESMI has introduced a new oil spill recovery product, RO-Kite, combining it with a DESMI SpeedSweep boom and RO-Skim skimmer to make cleaning up spills with just one vessel far easier, faster and more cost-effective.

ONE SYSTEM DOES IT ALL

Every now and then, something comes along that makes a real difference to the way an industry works. The latest addition to the portfolio of oil spill recovery solutions from market leader DESMI is one such product.

Christened “DESMI RO-Kite”, the new aquatic device, which is designed to replace the functions of a second vessel, has been eagerly anticipated by DESMI’s customers. In fact, RO-Kite can turn single-vessel oil spill recovery from a last-resort, difficult-to-handle alternative into the first choice for a wide range of spill situations. And, together with other products in DESMI’s oil spill recovery portfolio, it boasts a long list of advantages to back such a claim.

SINGLE-VESSEL BLUES

It doesn’t take a genius to work out that deploying and coordinating two vessels to operate an oil spill recovery boom between them is more expensive and logistically challenging than one. However, although single-vessel solutions have been in existence for some years, their use has been severely limited by a number of problems – mostly associated with the size, weight and rigidity of the equipment, as well as the comparatively slow speed at which it can be operated. DESMI’s new solution is different. By combining RO-Kite with two other, well-proven products, DESMI SpeedSweep boom and DESMI RO-Skim, the company has managed to create a system that makes cleaning up oil spills using a single vessel far easier, faster and more cost-effective.

“In decades of working in this field, we’ve seen a variety of ways to operate with a single vessel system,” says Henrik Jensen, Sales and Project Manager for DESMI Ro-Clean A/S. “Many have used a jib and a float attached to the stern and aft to keep the sweep in shape. But that’s too complicated. Today, the best approach is to use an aquatic device. The few devices already on the market, however, have presented their own set of difficulties.”

DESMI’s RO-Kite promises to change things for the better – and it is a key component of the company’s single-vessel system. Deployed behind the recovery boom, RO-Kite helps to keep the shape of the sweep, while the RO-Skim skimmer located at the apex removes the contained oil from the apex. At the same time, the heavy-duty, rubber SpeedSweep boom with its multiple permeable barriers boosts the speed at which oil can be recovered from the industry standard of 0.7 knots to as much as 3 knots. That’s a lift of more than 350 percent – and it’s clear evidence that, properly equipped, one vessel can easily perform the work of two.

COST AND HANDLING BENEFITS

Of course, experienced recovery vessel operators know that operating at higher speeds is just one side of the equation. Ease of equipment handling is every bit as important. The new combined system provides significant cost-savings for oil spill response contractors. Unlike other systems, which include a number of loosely connected devices in the apex, the DESMI solution guarantees easier maintenance, as well as fewer
possible problems. And thanks to the light weight of the RO-Kite, the entire system can be launched without the need for a deck crane. It’s clear that a lot of thought has gone into the handling of DESMI’s single-vessel solution. For example, where conventional booms incorporate a rigid, usually foam-filled flotation device, the RO-Kite is buoyed by air. To inflate the RO-Kite, crew can use the same air pump as used to deploy the SpeedSweep’s boom, further easing handling, transport and storage.

The list of advantages stacks up to a far safer solution, too, which is sure to please the Health and Safety departments of both contractors and their oil company clients. With fewer devices on deck, the potential for accidents is reduced – and the absence of a crane is perhaps the most compelling of these benefits. But it’s not just the crew that can operate under safer conditions. With rubber replacing rigid components as much as possible throughout the solution, there are fewer parts that could damage the hull of the vessel during operation. And that alone delivers new cost savings.

**SINGLE SUPPLIER INTERFACE**

“We’ve managed to create a complete, single-vessel oil spill recovery system using DESMI products alone,” says Henrik Jensen. “The skimmer is made from our material, we use a DESMI pump, even the self-floating umbilical hose from the skimmer to the vessel is a DESMI product.” The combination is proving to be a powerful argument for equipment buyers, partly because most oil spill recovery contractors prefer not to deal with multiple suppliers for components or technical support when disaster strikes and fast problem-solving becomes crucial.

**SELF-FLOATING HOSE SLEEVE**

The hose Henrik Jensen mentions is itself a noteworthy innovation. Called the ZUH (Zipper Umbilical Hose), it resembles a large, sleek anaconda – albeit one that can easily be opened or closed with a bright yellow zipper!

Snugly housed within this self-floating sleeve are the individual hoses required for transporting oil from the skimmer to the vessel’s holding tank. Its key advantage, then, is that it collects multiple hoses cleanly and simply, while removing the need to attach multiple flotation devices to each hose. Moreover, the oil skimmer fitted at the end of the ZUH can be operated both during winding off and while on the reel.

**WORTH THE INVESTMENT**

According to Henrik Jensen, the oil spill recovery market can expect to quickly gain advantages from the combined DESMI products:

“The DESMI RO-Kite and our single-vessel system really stand out. By turning single-vessel systems into a smart choice instead of a poor alternative, we can make an extremely worthwhile difference to how much oil can be recovered – in a shorter timeframe, with fewer resources and greater safety.”

At first, DESMI is offering its single-vessel system – and comprehensive hands-on training – for small to medium-sized vessels operating in open coastal waters. And an offshore model that can be used by larger vessels is currently in development.
DESMI MAKING IN-ROADS IN FRENCH BITUMEN MARKET

When a large road builder needs to build a bitumen plant or wins a road-building project, it typically asks an OEM manufacturer to provide a complete, turnkey bitumen plant. And in France, as with many other regions of the world, such manufacturers are increasingly turning to Danish-based pump manufacturer DESMI.

Bitumen presents heavy challenges for industrial pumps – the most pressing of which is the need to minimise or entirely eliminate leaking. “Bitumen is a tough substance to transfer,” says Nicolas Maunier, Sales Engineer for Danish-based pump manufacturer DESMI. “When the pump stops and the temperature falls, it hardens quickly. So any leaks will create an unsightly mess that is very difficult to clean up.” DESMI’s wide range of heavy-duty ROTAN® asphalt/bitumen and fuel pumps and accessory equipment ensures that bitumen can be quickly and safely transferred – and the pumps comprise only two moving parts for more reliable operation and easier maintenance.

The company has achieved particular success with its pumping systems for the tank terminals used to store bitumen, typically by large oil companies. Its many-year track record, however, spans stationary bitumen tanks that ensure continuity of supply for road projects, hot-mix or cold-mix plants where small stones are mixed in with the bitumen, and emulsion and roofing plants. For special applications such as the manufacturing of cathodes in aluminium plants, DESMI offers a magnetically coupled pump for ultimate protection against leakage, and maintenance-free operation.

COMING TO FRANCE
DESMI’s French subsidiary opened in 2011, aiming to capture more of the local bitumen market where, in fact, the company’s pumps had already been distributed for many years. “When we established the subsidiary, our main competitor had a solid position in the marketplace,” says Nicolas. “Right from the beginning, however, our bitumen pumps won a prestigious contract with ERMONT, the main OEM manufacturer in France. Since 2012, in fact, we’ve had a framework agreement in place to supply the company with around 50 pumps a year for a variety of applications.”

TRACK RECORD COUNTS
Despite the geographical size of the country, the French bitumen market is a tight-knit community where everyone knows everyone. And this is one of the principle reasons behind DESMI’s rapid road to success since setting up the local presence. “Every project you do well opens a door to the next one,” says Nicolas. “That also means, of course, that you are only as good as your last project! Fortunately, we’ve managed to get the formula right many times by now, so our reputation has become one of our best selling points!”

DESMI’s French team is excited about the future for the company’s bitumen business – not just in the local marketplace, but in more distant markets such as Africa, too. Africa is in desperate need of new roads, bringing with it the need to build local bitumen plants that can provide a steady supply flow. DESMI France also covers the company’s activities in Northern Africa, where a distributor provides local service, backed by DESMI’s expertise out of France or other locations around the world.

HOT PRODUCTS
“We have very good solutions for maintaining temperature in pumping systems – using thermal oil, hot water or electricity,” says Nicolas. “Today, most customers want electrical heating and 80 percent of our sales are made in this way to achieve a clean and cost-effective installation. In Africa, however, they generally need to heat pumps with thermal oil – and we can easily adapt to that need.”

Electrical heating deploys a temperature probe, mounted in a hole drilled in the idler pin of the pump. As the
idler pin is placed in the middle of the pump and its liquid contents, heating is concentrated where it is best used. Road tankers and plants benefit most from this method of heating, easily connecting to an existing power supply. Thermal heating is made possible by adding heating jackets to the pump’s front and rear covers.

**GOOD CONNECTIONS**

Most issues with DESMI’s pumping systems are relatively small and easy to solve, but the company’s service tradition still demands its staff to drop everything and focus on the customer until issues are resolved to the customer’s satisfaction. And according to Nicolas, having international access to specialised pump expertise is particularly useful for DESMI’s ability to win new contracts.

“Working in Algeria, for example, on a project for a new roofing plant, we were able to provide references from many projects we’ve conducted in Sweden and Norway stretching back more than a decade. Our subsidiaries in those countries sent a list of customer contacts that the Algerian’s company’s director was very welcome to contact. And that provided a strong comfort factor.”

Less common types of projects, such as those where positive displacement pumps are involved, make the most of such specialist assistance. Here again, DESMI’s French subsidiary can team up with other parts of the company to offer a specific solution for each problem. It’s an approach that adds considerable strength to the quality of pre- and after-sales service provided.

**ALL-AROUND CONFIDENCE**

Nicolas believes customer relationships are largely driven by the quality of the supplier’s employees. “If they’re highly skilled and service-minded, customers can quickly get comfortable. You have to really know what is important for them, and if you don’t have specific know-how about their challenges and operating models, if you don’t talk the same language, you’re unlikely to win their confidence.”

For many of DESMI’s customers in France, building those relationships begins with a visit to the company’s manufacturing plant and headquarters in northern Denmark. Some have also been invited to the Chinese facility. It’s a chance to meet many more of the people involved with the customer’s solution – and to put a face on potential contacts who may help to design, build or support future solutions, too.

**HD (HEAVY DUTY) CAST IRON PUMPS**

(Flow rates up to 250 m³/h [US number])

The HD PUMPS are typically used for the asphalt and bitumen industry. The modular design of the pump together with the large number of options makes it possible for the customer to design a pump solution fitted to his needs.

**ROTAN® DESIGN PARAMETERS**

- Capacity Range: Up to 250 m³/h / 750 US gpm
- Pressure Range: Up to 16 bar / 232 psi
- Viscosity Range: Up to 250,000 cSt
- Temperature: Up to 250°C / 482°F
Removing toxic residues from power plant flue gases is as tough on equipment as it sounds. Known for having the toughest pumps in the business, DESMI is looking to take on more of the power plant challenge.

POWERING FORWARD
The world is gradually moving away from traditional energy production such as coal and gas and, as a result of the drive towards sustainability in recent years, waste-to-energy and biomass power plants have become a popular production method. Like their fossil-fuel colleagues, however, these plants must remove or ‘scrub’ potentially hazardous pollutants from the flue stage of the process.

The system requirements for flue gas cleaning depend on a long list of factors. Gas cleaning of complex flue gases can be realized in many ways, either in a few or several steps. Each plant is more or less unique, and must be evaluated separately to achieve an optimal solution.

Gas-cleaning systems can typically be categorised as solutions to remove:
• Particles or dust collection without the need for pumps.
• The water-soluble gases SO2, HCl, HF and NH3, performed using either wet or dry gas cleaning.
• NOx (mainly NO)
• Highly toxic substances such as dioxin and mercury (Hg)

In all cases, where there are highly-corrosive chemicals flowing through pumps 24 hours a day, a production facility is likely to face costly repercussions in terms of risk, productivity and repair if the machinery should fail. Christian Busch, Danish-based industrial pump manufacturer DESMI’s sales manager for the utility sector across Europe, the Middle East and Africa, is very aware of the impact on machinery: “The ‘scrubbers’ are located after the boilers.”
Continued exposure to this combination of factors can rapidly have a detrimental effect on the pump machinery if it’s not specified and manufactured appropriately. We’ve spent more than two decades working with a very similar set of factors in pump supply to the maritime sector, and it’s partly from this that we got the inspiration to apply our technologies to land-based flue gas scrubbing, too.

COMING ASHORE
DESMI’s expertise in supplying corrosion-resistant pumps to the shipping industry has received extra focus in recent times. Particularly following the introduction of more stringent regulations governing sulphur emissions. Now, the company is increasingly the subject of attention in the utilities sector, too, for the supply of efficient, reliable and durable pumps in the various stages of the wet scrubbing process.

“We have built our reputation on several aspects that are equally as important in the power generation industry as they are in the maritime world,” says Christian Busch. “It’s the same formula, you might say, designing pumps fit for purpose and beyond, with reliability, efficiency, durability, ease of fitting and maintenance, and cost effectiveness as the key success factors.”

Over the past five years, DESMI has installed high-durability systems in power plants in its home market, and is now looking to extend its utility sales beyond the Nordic region with Christian Busch at the helm. And there is clearly a need in the marketplace: “We’re focused on getting to know the big companies that specialise in making custom-built systems for the various power plants – and we’re discovering that they are just as keen to learn more about us.”

HARD-EARNED REPUTATION
Quality of all components is obviously a key factor for both utility and manufacturer, especially when dealing with the processing and neutralisation of dangerously toxic chemicals. The pump units need to be particularly resilient to corrosion, they must be able to withstand continued load and usage over long periods, and they must ensure minimum down-time. The ramifications of taking a plant offline for essential pump maintenance due to malfunction or wear and tear can be immense – and commercially unacceptable. For these reasons, ultra-high quality pumps are an absolute must in such application areas, and DESMI’s centrifugal pumps in super-duplex stainless steel are well-suited to the task. DESMI believes that the versatility, strength and support services of its product line makes it an ideal choice for turnkey and sub-system companies delivering to both large- and small-scale plant projects.

As with all DESMI pumps at this level, service including replacement of bearings and mechanical shaft seal can be carried out without removing motor and piping, saving both time and money for the power plant, enabling utility staff to carry out service tasks themselves, and boosting uptime statistics. Christian is confident of DESMI’s ability to maintain customer satisfaction with its solutions: “Often, utilities require an extended warranty period, corrosion guarantees and fast customer service that can match such an aggressive, high-stakes environment. And that’s something we can definitely provide.” With more than 100 years of heavy-duty pump development and manufacturing for a broad range of demanding applications, DESMI is likely to have a lasting impact on power generation infrastructure for decades to come.

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**NSL STAINLESS STEEL**

**CAPACITY RANGE:**
- 30 - 1200 m³/h at 50 Hz
- 30 - 1400 m³/h at 60 Hz

**PRESSURE RANGE:**
- 15 - 60 mLC at 50 Hz
- 15 - 80 mLC at 60 Hz

**TEMPERATURE RANGE:**
- With standard mech. shaft seal up to 80 °C (170 °F)
- With special mech. shaft seal up to 140 °C (284 °F)
REFUELING OF DRONE AIRCRAFTS IN THE FIELD

All around the world Drone activities are increasing. Going from extremely sophisticated survey and attack drones to drones for fun. The drones you buy in toyshops are most likely battery operated. However, batteries are still rather heavy, meaning the more sophisticated drones are using fuel like air fighters.

DESMI is known for building refueling systems for especially Helicopters, both systems used onshore and systems used onboard vessels. Both ground refueling and Helicopter In Flight Refueling (HIFR). Based on the knowledge that DESMI is experts within refueling system, DESMI Ltd. in the UK was contacted regarding a refueling unit dedicated to Drone Aircraft in the field.

Regardless the Drone Aircraft Refueling System physically should be small, it should still include all the standard components in aircraft refueling:

- Filter with water separator, flow meter-recorder, pressure control switch to pump 100 liter/min at 3 bar, and of course hoses with dedicated nozzle. And not least, the unit should be Atex approved.

As an additional challenge, the task was to have the first prototype ready within five weeks. Having a team with a lot of experience, and a never failing readiness to take a challenge, the DESMI
team managed to have the prototype ready within the very limited period. The prototype was demonstrated at a DESMI Ltd. workshop. Unfortunately, we had no Drones flying around our premises, but at this first test, refueling into a tank was enough. The client was very happy with weight and operation of our Drone Refueling Unit.

As always when having extremely short delivery time, you will not be able to deliver the technically and commercially optimum system. Therefore, after seeing the concept as such was fulfilling the client's expectations, DESMI was now given six months’ time to build four units. Meaning now the optimum components could be sources, a little less weight could be achieved, etc. Further, we tested the units intensively before shipping the units to the client. When being involved in a new market, where you see a potential, you really want to be prepared and do not want to be in a situation where no fuel is entering the Drones.

This time the units were tested “in action” with real Drone refueling. It is always more exiting refueling a Drone instead of a tank. The client specified the pump should be 230V as they already had available generators used for smaller applications. When starting the Drone refueling pump, the generator died. This is a nightmare for all commissioning staff; our system is not working when many people is present. Sometimes such a situation ends badly. A lot of endless, not very constructive discussions having one item: Who to blame? However, sometimes something bad ends luckily; and so it did this time. Especially due to the technical skill among the client’s staff. It was quickly realized that the client’s generator was too small for the pump. This incident opened the discussion whether 230V was the right voltage for this application; working in the open under all kind of weather conditions.

From a safety point of view 24V DC is better for such applications compared to 230V or even 400V. Therefore, the incident led to the conclusion that the system should be re-designed for 24V DC. In conjunction with the client, we went through the specifications of the unit in general. Conclusion was that a little less flow capacity could be accepted.

Based on the new specifications DESMI achieved building a 24V DC unit with Atex zone 21 certificate. This saved some weight as the 230V motor is rather heavy. Further, the new flow requirements opened for using ROTAN® CC26EM pump. This positive displacement pump is known for small weight and volume, and being very price competitive. Further, the relatively low rpm for positive displacement pumps caused less emulsion of water in the fuel, if water should be present.

After this modification, the unit was tested again, in real action with the client’s generator. This time without any problems. The unit is now in the process of being codified – meaning being registered in the NSN – NATO Stock number system.

Now DESMI is in the situation that we can offer Aircraft Refueling systems for literally all types of aircrafts and aircraft applications; From Fixed wing, Helicopters to Drone Aircraft. This includes civilian applications as well as military applications.
DESMI ELIMINATES UP-FRONT INVESTMENT IN ENERGY-SAVING PUMPS
With its Pumps For Free concept, DESMI has removed a key barrier for shipowners to adopting cleaner, greener technologies and making energy savings: The up-front investment.

BOLD BUSINESS CASE

If you know of a better business case than this, then we’d like to hear about it. Industrial pump manufacturer DESMI’s ‘Pumps For Free’ payment model is set to take the maritime world by storm, offering to eliminate the up-front investment normally required for new, energy-saving pumps and asking for payment out of the shipowner’s demonstrated savings instead. Take DESMI OptiSave™, for example. It’s the company’s flagship offering in marine energy-saving systems, and earns its way by providing intelligent control of a vessel’s cooling water system. OptiSave™ uses what it learns to regulate the vessel’s energy consumption according to actual cooling requirements in the moment. Typical savings are of the order of 50 percent for cooling pumps operating in regions where sea temperature hovers around 28°C – and since a vessel’s pumps are a major operating cost, that’s a significant upside.

For some shipowners, however, such savings may still not be quite attractive enough to reach for their wallets. Or perhaps they’re convinced it’s a good idea, but don’t have the finances available to make the up-front investment in the near future. That’s where Pumps For Free comes in. Pumps For Free is a recently developed payment model designed to help DESMI’s customers get over one of the biggest barriers to installing energy-saving technologies. And the innovative pricing model makes opting for OptiSave™ – or a number of DESMI’s other products – a no-brainer.

100% NEUTRAL CASH FLOW INVESTMENT

Palle Grankvist, Manager of DESMI’s Automation department, explains how the model works: “Pumps For Free can be used for newbuilding or retrofit applications. Together with DESMI, the shipowner determines where an onboard energy saving can be made. The estimated saving is calculated by comparing the energy load of a vessel’s existing or specified (for newbuilds) pumping system, against the reduced expected load of a solution such as OptiSave™ – based on DESMI’s experience with over 300 similar installations. The estimated fuel savings of the new system are
then written into a contract between DESMI and the shipowner, under which equipment can be installed and commissioned without any money changing hands. As savings are realized, the shipowner begins to pay for the new system with the money saved – usually over a 14 to 18 month period."

"Pumps For Free, then, is a completely neutral cash flow investment. The numbers that underlie the model are tightly controlled, with a monthly performance report provided to the shipowner based on OptiSave’s data log. “Of course, there are a number of factors that come into play” says Palle Grankvist. “For example, we can’t control where in the world the vessel sails, which has an affect on fuel consumption due to sea water temperature differences, and we can’t control the speed of the vessel. Necessarily, each contract is also based on an oil price that is pegged at the beginning and remains set at that level for the duration of the contract.”

**BUILT-IN FLEXIBILITY**

It’s hardly news that today’s oil prices are subject to wild swings. And for one shipowner that signed up for Pumps For Free when prices were relatively high, payback time could be expected to have stretched several years into the future as barrel prices bottomed out. This however, wasn’t the case. “Even though oil dropped massively, our OptiSave™ system performed extremely well in cold waters for the customer;” says Palle Grankvist. “So the fuel prices made little difference when dropping, and will provide even faster repayment as they rise again.” DESMI’s characteristic flexibility, however, means the company is ready to adjust a Pumps For Free contract if an important factor should significantly deviate - for example, if oil prices radically alter or the vessel is laid up for half a year.

**THE CASE OF LIGHTHOUSE SHIPPING**

One shipowner who chose to install OptiSave™ systems under the Pumps For Free payment model is Norway-based Lighthouse Shipholding AS. In 2015, Lighthouse was building a series of bulk carriers at a Chinese shipyard alongside DESMI customer Spar Shipping. The Spar Shipping newbuilds were specified with OptiSave™ systems and the project’s supervisor brought the energy-saving possibilities to the attention of Lighthouse Shipholding CEO Frode Bjørklund.

FRODE BJØRKLUND CONTINUES THE STORY:

“I joined the company in January 2015. The shipbuilding contract for our five new vessels had been inked in 2013, Frode Bjørklund, CEO, Lighthouse Shipholding
and OptiSave™ wasn’t in the Scope of Supply. Fleet Management in Hong Kong were doing the supervision for us and for Spar Shipping, and they mentioned the solution to us as one of three alternatives for improving the vessels’ spec beyond the original agreement.”

As a newly started CEO, Frode Bjørklund already had his plate full. After an initial look at the idea, he lacked sufficient time to take things further, and the proposal languished on his desk. “It was a very busy period, but when I did get a moment, I visited the DESMI website, spoke with the company, and decided the Pumps For Free concept looked very interesting indeed.”

NO-BRAINER
By then, Fleet Management had performed early tests of OptiSave™ on one of the Spar Shipping vessels and made a more solid recommendation to Lighthouse Shipholding. “Like any financially driven shipowning company, we needed a strong business case with a horizon well within the lifespan of the vessel. Pumps For Free seemed to be a very compelling case, so we started talking to DESMI about payback time, looked at oil price trends, and worked out the likely ROI for our vessels. In general, the financing aspect of the deal – its cash neutrality – got our investors on board and we decided to include OptiSave™ on the four vessels remaining to be built. For the first vessel we will consider a retrofit as it is only marginally more expensive. In fact, going for the concept was almost a ‘no-brainer’!”

NO CORNERS CUT
Frode Bjørklund is highly positive about his experience with both DESMI and OptiSave™. “We met with DESMI in Shanghai at the yard and have been working closely both in Scandinavia and at the local level. I’ve found the company to be open-minded and easy to talk to. And they have good shipowner customers on their reference list, too, including one widely considered to be the industry’s technology leader.”

Lighthouse Case Pumps for Free
“DESMI has cut no corners on building a great system. Even though we have been running the vessels mostly in warmer water temperatures, which means we would have expected lower savings, it has still delivered according to schedule. And in a trans-Atlantic scenario, we would see even more savings.”

Greenfields concept for a greener world. In principle, the Pumps For Free payment model can be used on any application, including pump replacements, engine room fans and LED lighting, where an energy saving can be reliably measured. And DESMI is constantly working to refine the concept and add new products and features to the Pumps For Free portfolio.

Palle Grankvist: “Today, we can offer shipowners the option to get online with their OptiSave™ system via our servers. So they can see the performance of the system, and generate reports. Being connected in this way also enables us to trim the shipowner’s system for even higher savings.”

THE BENEFITS OF DESMI OPTISAVETM

- Energy saving up to 90%
- Short return on investment
- Prolonged lifetime of pumps due to less wear and tear
- Minimum changes in existing electrical installations
- Proven technology
- Proven savings from +300 systems in operation
- Reduced OPEX
- Worldwide service support
HIGHER-QUALITY PUMPS WORK BEST FOR BULK LIQUID TERMINALS

When you’re running a dockside petroleum liquid products, chemicals and LPG/LNG or multiple bulk liquids terminal, your reliability as a supplier — and the ability to win repeat business — is heavily reliant on the quality of the fluid-handling equipment and pumping systems on hand.

RELIABILITY RULES
For terminal operators, reliable handling and high transfer speeds are critical for dockside transfer, bunkering and re-distribution of petroleum fluids, oil and liquid chemicals, fuel oils and other bulk liquids.

“Energy-savings are important, certainly, but the first priority for storage terminal operators is the
system’s loading and unloading speed and its reliability,” says Mr. Jimmy Ng, DESMI Singapore’s General Manager. “Operators must deliver customer-stored products to specific destinations on time and avoid port delay costs or contract penalties, for example, so a very stable pump throughout the whole operation is crucial.” Rotary pumps, such as those produced by Danish-based industrial pump manufacturer DESMI under the brand name ROTAN®, are an excellent means of doing this.

ROTAN® pumping systems can transfer up to 250m³ per hour for a wide range of fluid materials, so they’re ideal for loading into road tankers, ISO road tank containers or small vessels, and for drumming. Typical applications include oil and chemical transfer, often for distributed bunkering, and bitumen transfer. Oil or chemical cargo coming from crude tankers is usually pumped into storage tanks on land using the shuttle tanker’s pumping systems.

From there, the oil is then transferred to a road tanker or an ISO road tank container, trunk-routed or drummed. Some terminal operators transport oil or chemicals for drumming at a one-stop warehousing service partner. Bitumen terminals, on the other hand, receive, store and transfer raw product for asphalt. The bitumen arrives on larger-capacity ships, and is usually then pumped into storage tanks before being re-pumped to road tankers for distribution to mixing stations around the country.

**FROM SPECIALISED TO MULTI-USE**

In the past, terminal operators preferred to operate specialised pumps for each application. Now, the tendency is to use a single pump for multiple functions. DESMI has answered this relatively new need by incorporating, for example, a frequency inverter with system control devices such as meters, sensors and gauges, enabling pump speed to match the variable flow and variable system operating pressure, as well as the variable viscosities of pumped fluids. Naturally, working with a variety of bulk liquids can be tough on pumps, but it also demands more of the terminal operator’s staff, too.

DESMI’s edge in the market for industrial pumps isn’t just the pumping equipment itself. Instead, the company’s technical knowledge has proven a valuable asset to winning orders and keeping things running smoothly once everything has been installed. “You need to know about pumping systems, processes and operations,” says Mr Ng. “Achieving the best results demands awareness of all operational aspects, including the challenges and the impact on the pump of each operational mode – whether it’s loading ships or trucks, drumming, stripping to completely empty the storage tanks, or tank clearing. Almost every order we get is backed by solution selling – the ability to knowledgeably discuss with the customer, the operator and the maintenance guy not just the pump itself but the entire operation. Some units are used for handling different grades and viscosities of petroleum oil with huge differences in operating conditions and expectations, so you need to understand the whole picture – will the specified pumps and accessories be able to meet the complete operational expectations? And where are the strengths and weaknesses in relation to the entire operation requirements?”

**DESMI IN DEMAND**

DESMI’s pumps are widely used all over the world. One customer, for example, operates a wide portfolio of oil and petroleum products terminals in many parts of the world. In Singapore, with its status as a key international cargo hub, the operator’s terminals support chemical and oil companies, trading companies, and national oil companies.

Various DESMI pumping systems are installed at these terminals, handling different types of transfers depending on the functions of the terminal and the demands of specific contracts the operator signs with its customers. In Vietnam, DESMI pumps keep
things moving at a major bitumen marketer that imports, stores and distributes asphalt for road building and infrastructure developments in the country.

The marketer’s terminal at Haiphong boasts wharf facilities with a state-of-the-art bitumen storage terminal and a capacity of 5,000 metric tons. The company is one of two large bitumen companies using DESMI equipment in Vietnam. DESMI pumps are also installed at the bulk liquid terminals of Indonesian-based customers.

THE KNOWLEDGE LOSS PROBLEM
“The type of products and operations determines the pumping system required,” Mr Ng explains. “Typically, a terminal operator will sign a three- to five-year contract based on existing facilities, or will turn to someone like DESMI to provide an appropriate pumping system that meets contract needs – and that’s where having a good relationship to the pumping solution supplier really makes a difference.”

To achieve a reliable, ready-for-action pumping system, you need to have operational staff who are familiar with the equipment and able to adjust the various operational parameters required to ensure optimal flow. In Singapore, many of the equipment operators in bulk oil terminals are contracted workers with little knowledge of handling pumping equipment. They have limited operational experience, a narrow understanding of the overall pumping system and terminal operation, and are typically under time pressure. It’s important, therefore, to choose pumping equipment and solutions from a supplier that can offer the technical support – and application know-how – to operate an efficient storage terminal.

RAPID REPAIR
DESMI’s pumps feature another key advantage that is closely related to the ability to quickly recover from mechanical failure, restoring the pumps back to operation with minimal down-time. “The heaviest part of a ROTAN® pump is the ‘pump casing’,” says Mr Ng. “DESMI casts the foot of all its pumps on the casing. On the one hand, this provides extra strength to withstand any stress from piping misalignment or system loads and reduces vibration. On the other, it means you don’t have to remove the casing for repair or servicing if required. When installed with a space coupling, for example, the rotating assembly can easily be removed from the casing for inspection or repair without disturbing the piping, pump casing or coupling alignment. So customers can keep a few key components on hand that can be quickly swapped out without needing a highly skilled technician.”

Such rapid repairs are particularly important for liquids such as bitumen, which can’t be allowed to cool down within the pump for long. Bitumen is a product that DESMI’s technical advisors know inside and out, and the company’s team typically spends a great deal of time talking to the bitumen plant’s end-user, discussing typical challenges faced, and constantly exploring new

**ROTAN® PD**
- Petrochemical Duty Pumps
- PD pumps are designed for refinery and petrochemical applications, all pressure-containing components are in carbon steel.
- Design pressure according to ANSI 300
- Lbs or Pn40. PD pumps meet API 676 2nd edition standards with only a few exceptions.
- Available with 90° angular configurations.
- Capacity Range Up to 170 m³/h / 748 gpm
ways to improve performance and reliability. DESMI encourages its pump distributors to take the manufacturer’s representatives along to customer meetings, helping to bring both depth and breadth of application and product know-how closer to the customer.

**KNOW-HOW BEATS PRICE**

As could be expected, falling oil prices have had an impact on operator’s willingness to pay for premium equipment. The equipment pricing remains an important part of the overall picture but there are many others important factors need to be considered as well when chosen of pumping equipment supplier, “At the end of the day, know-how and good service support to the customer is what sells the solution,” Mr Ng explains. “Once customers start to understand the full picture of high-quality pumping solutions and service support and perhaps inviting the customer for a visiting trip to our factory or visit to other operators’ terminals to hear the good success stories of DESMI Pumping Solution, it’s relatively easy for them to realize the extra value they’re getting.”
HIGH-QUALITY PUMPS HELP FISH FARMS HANDLE GROWTH

Pumping systems manufacturer DESMI’s Peter Laursen offers advice to farmed-fish processing plants looking to invest in high-reliability, scaleable pumps to meet production pressures. With fewer and fewer fish in our seas, fish farming has grown to become an enormous industry worldwide – with billions of dollars in revenue and continued growth forecast for decades to come.

Like any industry of this size and growth rate, fish farming requires a reliable, high-throughput production apparatus to keep up with market demands. And, while they may not be the first thing most people associate with fish farming, the pumping systems used by today’s leading farms have become a business-critical factor in keeping costs down and production capacity up.

A GROWING INDUSTRY

Fish farming’s share of total fish consumption has increased from around five percent in 2007 to approximately 50 percent today. By 2030, according to a study jointly conducted in 2014 by the World Bank, the FAO and the IFPRI, heavy demand may see the industry serving two-thirds of worldwide needs. A variety of factors are driving this growth, which has seen the average person’s intake of fish double since the 1960s. Among these are the widely accepted belief in the need for omega 3 fatty acids, expanding consumer wallets, and highly modernised production systems.

For the world, fish farming is a necessary development, helping to compensate for the continued depletion of wild fish reserves. At the same time, responsibly conducted fish farming is generally kinder to the environment, with 1 kg of carp, for example, requiring around 15 times less food to bring to market than the equivalent amount of beef. In global terms, Asia leads the industry. And with good reason. China, for example, will consume as much as 40 percent of annual food fish production by 2030, and is investing heavily to enable fish farming as a food source for its immense and growing population.

SCANDINAVIAN TRADITION

Scandinavia is no stranger to fish farming, either. In the Faroe Islands alone, the industry accounts for around 50 percent of BNP. This far-flung archipelago, with its unspoiled nature and waterfalls, has a long tradition of fishing, and has made the transition to fish farming in leaps and bounds. Peter Laursen, Area Sales Manager for Denmark-based industrial pumping systems manufacturer DESMI A/S, is a frequent visitor to the Islands. He is very familiar with best practice farming methods and, in particular, with the role his company’s pumps play in keeping production up and running.

“Last week, I visited a major fish farming company in the Faroe Islands that’s building a huge facility for breeding and slaughtering salmon using the fjords, and another facility for producing feed,” he says. “Despite my years in this industry, I’m still impressed by the scale of things, and I’m very interested in the difference that can be made by using today’s technologies to modernise fish farming and processing.”

FISH UNDER PRESSURE

In a typical, large-scale fish farm factory, daily loads of live salmon arrive by large ‘well boats’ before being pressed into the facility with the aid of giant pumps. For the Faroe Islands producer, DESMI is providing pumping systems to provide the new facility with seawater, helping these vessels to offload by creating a flow of water in large onboard tanks that is then released with the fish when a
valve is opened to the plant. “The job doesn’t stop there, of course,” Peter Laursen continues. “With regulatory authorities careful of threats to the environment, well boats aren’t allowed to release water before it has been treated with UV or similar techniques to remove or incapacitate potentially invasive organisms.” DESMI’s systems are also present in the processing plant itself, where large quantities of seawater need to be moved around as an indispensable part of production.

ADVICE FOR PURCHASERS
For those investing in up-to-date pumping systems for their vessels and processing plants, Peter Laursen has good advice to share. “Typically, you’ll need huge pumping capacities – as much as 1,000 cubic metres per hour at quite low pressure. The machinery needs to be able to withstand the wearing effects of sea water, so we use bronze alloy, which is the same robust material as used for seawater cooling on commercial vessels. Our marine pumps are all equipped with heavy ball bearings, too, rather than the sleeves and other mechanical parts used in many other applications.”

Peter Laursen goes on to explain that, while investments in such systems are significant, the costs of cutting corners can be far worse. “Reliability is a must, because a low-quality pump can stop the process entirely, quickly resulting in tons of rotting fish and heavy daily losses. It’s a major business risk that simply has to be dealt with.” With so much at stake, producers take other precautions, too, such as standby pumps that are always ready to take over if the worst should happen.

In Peter Laursen’s opinion, however, the best line of defence is always to ensure the primary systems are as reliable as possible.

With fish products already a high-priced consumer item, Peter Laursen advises producers to take advantage of low-energy systems, too – an area where DESMI has carved out a particular niche for itself and its customers. Low energy consumption is assisted by frequency converters that enable pumps to increase or decrease the power generated by their electrical motors depending on the current processing load.

THE CUSTOMER IS KING
High on Peter’s list of recommendations, too, is something that a quick glance through a manufacturer’s catalogue won’t usually reveal: flexibility. “For the plant we’re talking about here, the vertical pumps that are usually used turned out to be too tall for the factory pump room, due to the customer having to lower the building’s ceiling for other reasons. The problem showed up quite late in the delivery schedule, but due to our decades of experience with pumps of all types – and a comparatively flat decision-making structure within DESMI, we were able to move from idea to final design in a remarkably short time. Everyone from design engineers to management got behind the project, keeping bureaucracy at bay and staying tightly focused on the customer’s needs and priorities.”

Flexibility has long been a key competitive advantage for DESMI, whose products are based on a philosophy that, while around 80 percent of a pump type may be standardised, there is still plenty of room to add specific features for a particular application or customer.

RELIABLE REPUTATION
Peter Laursen’s role as Area Sales Manager for DESMI’s fish farming pump systems is helped along by a solid reputation built up by the company over many years. “We’ve been working with fish farming pumps for more than 10 years. But many people in the industry know us from other applications and ask to have our pumps for their fish farming facilities, too. So our reputation for good, reliable products, good service and ease of access to spare parts in the marine sector has carried over to this industry, too.”

DESMI is expecting strong growth for the future. In China, for example, the largest fish farming country in the world, efficient production of food is a key priority. And fish farming’s high efficiency and sustainability makes it a highly attractive focus area. “We will be more active in Asia going forward,” says Peter Laursen. “Asian fish farming is done differently, but all such plants require pumps to add new water to the plant or to circulate water to maintain a certain temperature, so there is plenty of room for us to grow. And, while a new plant may not be built every day, well vessels are constantly being launched from the world’s shipyards – and each one is potentially a good home for a DESMI pumping solution.”
PUMPS & PUMPING SOLUTIONS
For the pumping of high-viscous liquids

APPLICATIONS
Chocolate
Asphalt
Desalination
Isocyanate
Oil Blending
Paint & Ink
Pulp & Paper
Soap & Detergents
Sugar & Molasses
MAGNETICALLY POWERED PUMPS SEAL THE DEAL

For companies pumping dangerous or expensive chemicals, leaks can endanger both personnel and the bottom line. Hermetically sealed, magnetically powered pumps are the state-of-the-play answer.

The list of potentially dangerous or simply-too-expensive-to-lose substances being pumped from one part of an industrial process to another somewhere in the world is long. Take isocyanates, for example. They’re the raw materials that make up all polyurethane products. Despite their relatively low acute toxicities, isocyanates can present harmful effects to the eyes, skin and respiratory tract (methyl isocyanate, for example, was at the centre of the 1984 Bhopal disaster).

Of course, few manufacturing or processing plants pump such substances on a truly large scale. But even the smallest of plants need to be sure they aren’t exposing their workers or surroundings to danger when working with solvents, printing ink, resin, pitch or hazardous organic liquids. And they need to guard their business economics against leaking non-hazardous, but pricey raw materials such as linseed oil, corn syrup or soyabean oil. In such situations, the best and safest type of pump to use is a hermetically sealed, magnetically powered device based on the ROTAN® principle.

PATENTED NO-LEAK PRINCIPLE

The basic concept of a ROTAN® pump differs from those of conventional pumps in that everything is completely and entirely sealed inside. Dirt or other contaminants have no way of entering the pump, and nothing within the pump can leak out.

The secret to achieving a fully enclosed design lies in the fact that, in contrast to conventional pumping systems, no holes or channels are required to bring electrical power into the pump. Instead, the medium being pumped circulates around a magnetic coupling carrying exactly the right number of magnets required for power to be transmitted from outside the device. Simple ‘centrifugal pump’-shaped channels in the shaft and rotor ensure

KEY FEATURES AND BENEFITS FOR ROTAN® ED

• Reversible direction of flow with double acting relief valve option available.
• Coupled direct to NEMA or IEC motor for speed up to 1750 rpm
• Directed coupled gearbox with NEMA or IEC electric motor eliminating alignment issues
• Adjustable rotor end clearance without opening the system to the atmosphere
• Torque capabilities in excessive of 800 ft-lb
• Flow rates max. 90 m3/h with differential pressure up to max. 16 bar.
• Iron, Steel and Stainless Steel construction
• Tungsten Carbide abrasive wear materials are available for abrasive duty applications
continual replacement of the liquid heated by friction and re-circulation in the coupling. At the same time, this ensures efficient lubrication as well as heat transfer from the slide bearings. The pump can be easily reversed, too, causing its medium to flow in the opposite direction simply by reversing the motor’s direction. Finally, unlike centrifugal pumps, a ROTAN® pump offers gentle liquid-handling and a high priming vacuum, along with the ability to pump highly viscous liquids. The unique, patented ROTAN® principle is generally recognized as the most advanced internal gear pump design available anywhere today. And it’s far and away the best solution for safely moving hazardous or costly substances. As an added bonus, there’s very little residue build-up, so far less cleaning is required.

SAFETY IN PRODUCT AND SUPPLIER
While many pump manufacturers aspire to offering ROTAN®-style technology, DESMI A/S currently rules the market with its ROTAN® ED pump. The Denmark-based company has produced these pumps as part of its extensive product portfolio for over 20 years, building an impressive technological lead. “By now, we’ve worked with this pump design in a tremendous variety of industrial applications,” says Peter Tipsmark, DESMI’s Industry Segment Director. “And that’s every bit as important to prospective buyers as the quality and functionality of the pumps themselves. At the end of the day, it’s this depth of experience that ensures high safety levels as well as maximum returns on the investment.”

ALL THE OPTIONS
DESMI seems to have thought of all the angles for its top-of-the-line pumps. For substances that need to be cooled, an integral pump eliminates the need for external cooling. And for those that like it hot, optional external heating jackets can be added, enveloping the pump’s front cover and magnetic coupling housing. There’s a choice of materials, too. Slide bearing materials, for example, vary from cast iron, bronze, carbon to tungsten carbide. The magnets themselves are made of neodymium-iron-boron, and optional samarium cobalt permanent magnets allow operating temperatures as high as 250o Celsius. And both internal and external canister protection is offered.
INCREASING DEMAND
Market-leading companies such as BASF, Huntsman and Bayer have long been using ROTAN® technology from DESMI, but they’re not the only ones to see its advantages. And in many cases, companies approach DESMI to replace existing double-seal solutions that can’t live up to the task. “There’s never been a better time for ROTAN®-style pumps,” says Peter Tipsmark. “We’re installing them, for example, in increasing numbers to Asian markets, as well as emerging markets on the African continent. In China, for example, ROTAN® technology has quickly become accepted not just for large enterprises, but for smaller ones, too. Basically, the need for optimum safety is the same no matter where you operate.”

In China, Guangzho Strong Chemical Co., Ltd, a leading domestic producer of automotive refinish coating material, is a recent customer for DESMI’s pumps. Facing increasing demand for its product, the company expanded production capacity with a new factory in March 2014. After careful evaluation of the ROTAN® ED pump’s technical advantages, its total lifecycle, and the safety track record DESMI was able to document, Guangzho joined a fast-growing list of ROTAN® technology adopters in the region.

“Guangzho were interested in a complete pump solution that could take into account liquid properties and the piping layout,” explains Peter Tipsmark. “So we held numerous meetings with both the company and its engineering supplier to understand more about their needs. It’s the only way to arrive at a great solution – and the results speak for themselves.” DESMI is continuing to upgrade its ROTAN® pump line-up, following growing market demand, and keeping businesses and people safe with this well-proven technology.
DESMI LIFTS GREEN SHIP BUSINESS CASE

Maritime pumping solution manufacturer DESMI’s energy-optimisation approach generates positive cashflow for shipowners struggling to comply with new regulations.

NEW RULES CALL FOR FRESH APPROACH
It’s hardly news that the shipping industry is mobilising to meet the demands of wave after wave of new environmental regulations. From the IMO’s ballast water management legislation to EEDI (the Energy Efficiency Design Index for new ships) and SEEMP (Ship Energy Efficiency Management Plan), shipowners need to be ready to drastically cut energy consumption and emissions.

Vessel and equipment producers have, of course, risen to the challenge, devising tools and strategies from new, energy-saving hull paints to higher-capacity container ships. But is there a way to make the necessary investments to satisfy regulations and create savings, too? Pump solution manufacturer DESMI, drawing upon its long track record in the development and manufacture of pump solutions for marine, industry, oil spill, defence and energy industries, has some of the answers to that question.

The Danish-based company is focused on reducing energy consumed by onboard equipment in and around engine rooms. With solutions covering everything from seawater pumps to ventilation systems, the company has found plenty of ways to cut consumption. Its solutions have surprisingly short payback times – but often, the most compelling aspect is the annual savings that follow. And the company is putting forward solid customer data to prove its claims.

OPTIMISING ONBOARD ENERGY
Auxiliary systems in engine rooms and their pump components are designed to cope with the worst possible foreseeable conditions. In reality, however, such systems can be made to run at operating levels that better correspond to the vessel’s actual load at any particular time. And according to DESMI’s Michael
Lassen, Segment Director for Marine & Offshore, this is an excellent strategy for shipowners keen to comply with the new regulations.

“A lot of onboard machinery constantly operates as though the vessel is under 100 percent load and having to cope with air temperatures of up to 50 degrees Celsius and sea water temperatures up to 32 degree Celsius. But those conditions reflect perhaps only one percent of a ship’s operating lifetime. The rest of the time, you might say, it’s like running the heating in your house at full blast with the windows wide open. Making control systems that closely match energy consumption to actual requirements is something we’ve been focusing on for a number of years.”

SAVING ON PUMPING POWER
As a starting point, DESMI’s own seawater pumps are designed to pull maximum efficiency out of today’s pumping technologies. But the company doesn’t stop there, extending its energy efficiency range to optimisation solutions such as DESMI OptiSave™ which can, for example, save up to 80 percent of power consumption for a vessel’s seawater pumping tasks. “We have delivered many of these solutions by now,” says Michael Lassen. “And all have been shown to provide 60-80 percent savings for ships travelling, for example, between ports in Europe and Asia.”

Seawater pumping systems aren’t the only pumps in a vessel’s engine room. Other systems cool down steam that hasn’t been used in steam turbines, for example, condensing vapour into liquid again before re-feeding it into the boiler. When there is little steam to be returned to the condenser, less seawater is required, enabling the speed of the pump to be reduced to a necessary minimum. Another area for potential savings arises, for example, when the vessel is sailing at lower speeds.

Normally, 3-4 fans push compressed air into the engine room to boost combustion effect. These systems usually run at full speed, regardless of load, even when less air is required. DESMI’s OptiSave™ controls these components, too, reducing their speed to correspond to real needs. DESMI also applies similar thinking to the sulphur-removing scrubber systems required for vessels operating in Nordic SECA (Sulphur Emission Control Area) zones. Such systems use a ‘rain shower’ of water to clean the gas produced by heavy fuel oil, removing sulphur and other undesirables before releasing the exhaust into the atmosphere. Highly resistant, stainless-steel pumps provide the seawater for this process and, with the scrubber system placed at the highest point on the vessel, they typically consume considerable energy.

ALL-IN-ONE OPTIMISATION
A key advantage of DESMI’s Optisave™ is the ability to install just one piece of extra onboard equipment to control the energy for seawater, condenser and engine room fans. With just one cabinet, ship designers can easily incorporate new energy savings without significantly adding to the deckspace headaches already caused by the need to install additional systems for environmental compliance.

POSITIVE CASH FLOW
So why is all this onboard energy saving a good deal for the already cramped budgets of today’s shipowners? Michael Lassen claims that, apart from the benefits of sheer regulatory compliance and continued access to profitable sailing routes, the potential savings of onboard energy control systems have proven to be quite spectacular. “While it may be tempting to let tight newbuild budgets dominate onboard equipment specifications, shipowners can do themselves a favour by focusing on
the medium and longer term numbers behind high-end pumps combined with energy-optimising systems like OptiSave™.

“Fuel is the most expensive component of the maritime business model. So once such a system is installed, it’s quick to prove its worth. And with the initial investment recouped, the shipowner actually earns money every single year until the vessel is decommissioned, sold or scrapped.”

DESMI has plenty of data to prove its claims. The company’s off-the-shelf optimisation systems achieve a six-month payback time for new-buildings, which is blindingly fast for most engine room additions. Turnkey systems, such as those recently sold to one of the world’s top three container lines, achieve their payback in around 18 months. After that period, savings of EUR 35,000 annually per vessel are achieved. These particular systems were retrofitted on vessels in operation, and DESMI was responsible for project handling, installation and commissioning, all for a fixed price.

“With annual gains like these, even the current oil price slide isn’t affecting the general business case – or our sales of new systems. And everybody knows that the oil price will not stay this low forever,” says Michael Lassen.

**BALANCING THE BOOKS**
Energy-optimising systems also help to make sure shipowner business models don’t suffer from the additional fuel consumption associated with ballast water treatment systems and other new, mandatory equipment. Here, optimisation power-savings can balance the fuel equation to maintain vessel profitability.

The strongest argument for DESMI’s green ship solutions is to be found in the data it has made publicly available at www.optisave.info - and in the specific calculations its energy experts can carry out for interested shipowners and their vessel designers. But according to Michael Lassen, there’s still more work that can be done to squeeze further savings out of today’s auxiliary systems on board vessels. “The new energy efficiency index regulations are pushing us to develop even higher-efficiency pumps. We are still trying to lift up from 80 to 85 percent efficiency; challenging ourselves to do better because we know that these pumps run around the clock – so even a five percent improvement can make a very worthwhile difference over time.”

**PUMPS-FOR-FREE**
Among DESMI’s innovative approaches is ‘Pumps-for-free’: a cash flow-neutral investment concept for energy-saving solutions. It’s a unique financing package, enabling shipowners to energy-optimize their vessels while repaying the investment through savings, typically in 14 to 18 months. The financing schedule is linked to the ROI/payback period, with quarterly payments.

DESMI offers a wide range of energy-saving products under the Pump-for-free concept, including:

- Replacement of older low-efficiency pumps with DESMI’s highly energy-efficient pumps
- Retrofitting of Energy Savings Systems, also known as OptiSave™ for Sea Water Cooling pumps
- Retrofitting of Energy Savings Systems for fresh water cooling pumps
- Retrofitting of Energy Savings Systems for engine room fans
- Customized solutions

“Many of our customers prefer to take advantage of our turnkey solutions, where we take care of everything from pre-inspection to commissioning. Others like to install the solution themselves, turning to DESMI to carry out commissioning,” says Michael Lassen.
The concept of burning spilled or leaked oil on the sea’s surface has been known for many years, offering an extremely effective way of reducing the spill by as much as 90 percent with minimal equipment. The method, commonly known as in-situ or controlled burning, takes advantage of the fact that oil can be ignited on water if the layer is at least 3 mm in thickness – even under Arctic conditions.

Compared with mechanical clean-up, chemical dispersants and natural assimilation, in-situ burning is highly effective, particularly in remote areas where the resulting smoke plume isn’t so visible, or where it is difficult to deploy other types of clean-up equipment. Moreover, if properly employed, in-situ burning can result in the least detrimental overall impact on the environment. Although these advantages had long been recognized, the true potential of in-situ burning could not be realized: the technology to do the job properly simply wasn’t available, and regulatory acceptance was slow in coming.
THE JOURNEY BEGINS
It wasn’t until the late 1900s, in fact, that the first steps were taken in a journey that would finally see in-situ burning emerge as a mainstream option. Numerous research efforts aimed at finding the most efficient burning means were conducted or commissioned by Shell Oil Company, Dome Petroleum and Exxon (now ExxonMobil), all with significant production in Canada and on the Alaska North Slope. These investments sparked a wave of new exploration into the development of durable, fire-resistant materials that could deliver on the promise of in-situ burning.

In 1982, a landmark Exxon Production Research project began to explore the technique of in-situ burning in earnest. At that point, the materials available for use were hopelessly inadequate. For a time, the best available practice was to take a conventional boom, wrap a multi-layer fabric “blanket” around it that could absorb as much seawater as possible, then light the oil and hope for the best. At some stage, however, a salt line or silt build-up could form in the material, allowing the fire to take hold and burn the fabric away – making the solution time-consuming and expensive to use. Despite various attempts to remedy such problems, the “water-cooled” model faced significant challenges.

A LACK OF STANDARDS
The lack of durable material wasn’t the only issue to be solved, however. The industry was also far from reaching agreement on appropriate standards for the equipment that would enable offerings from different manufacturers, for example, to be used seamlessly together. In short, much work needed to be done.

Peter Lane, Vice President at DESMI Inc., North America, takes up the story: “Back then I worked for a company in the industrial fabric business called Albany International, Inc. We got a call from Exxon, asking us to come up with a material that was not water-cooled, but which could handle the heat of the
ADVANTAGES OF IN-SITU BURNING

• Removes large quantities of oil quickly
• Eliminates the recovery and disposal chain
• Practical in a wide range of conditions, including broken ice, open water, intertidal zones, rivers, swamps and marshes
• Low net environmental impact when performed properly
We are also examining safety aspects, aiming to mechanize handling so as to remove any risks there might be in manual procedures.”

DESMI’s R&D team is looking at ways to improve burning results, too – whether in-situ or in conjunction with skimmers. A key issue is the need to broaden the current operating envelope: presently, in-situ burning can be undertaken in a relatively narrow range of weather and sea conditions. “During the Deep Water Horizon cleanup, we had relatively calm conditions,” says Peter Lane. “And, because the disaster was a blow-out, there was fresh, thick oil every day. That made it perfect for a fireboom solution, which was highly economical in comparison with mechanical recovery.”

ENVIRONMENT
Since clean-up operations, no matter which technique is used, are all about protecting the environment, the idea of a burning oil slick with a thick, dark cloud of smoke entering the atmosphere may appear counter-productive. Here however, Peter Lane is quick to point out the relatively positive environmental effects of in-situ burning: “A lot of work has been done on the content and effects of the smoke cloud. We’re just creating soot, which is straight carbon. It looks nasty, but it goes away quickly and the smoke plumes aren’t as large as you might think. We’re effectively eliminating almost all of the toxic constituents, for the most part leaving only solid carbon, carbon dioxide, carbon monoxide and a minor amount of liquid oil when the day is done. The products and residues of the combustion are a very small fraction of the initial spill. They usually float, and can be recovered mechanically after burning.”

SLOW BUT STEADY PROGRESS
With the Arctic region playing host to a growing number of vessels and offshore platforms, DESMI’s efforts to further refine in-situ burning are crucial to protecting the future of the local environment and wildlife. But advances in the market for fireboom equipment and techniques are few and far between. The problem, according to Peter Lane and his team, lies largely in the fact that, thankfully, major accidents are uncommon, low-probability events.

“The problem in the oil spill industry is that it can take a very long time for new ideas to come to market – and even new, disproven ideas take time to leave. With Deep Water Horizon, ideas came out of the woodwork that had been shown to be bad ideas back in the seventies. Now they have resurfaced all over again and they’re still bad.”

With oil spills hardly an everyday occurrence, and few players as seriously involved as DESMI, the pace of technological development is slow. Every new event raises the level of interest for a period of time, bringing fresh people into play who, according to Peter Lane, don’t have enough experience in the industry to realize that many of their ideas have been unsuccessfully tried before. Thankfully, there are a number of organizations in or around the oil industry that front up with R&D funding aimed at evaluating new concepts for in-situ burning and bringing the best of these to a commercial level.

HEARTS ON FIRE
“We’ve been involved in in-situ burning almost as long as it has been a concept,” says Peter Lane. “We’ve developed products and operating techniques, and played a big role in setting standards. It’s second nature to us – and we feel we’re doing something that can really make a difference.” The dedication of people like Peter Lane and Peter Newsom, another long-time fireboom expert who joined the team in 1992, has clearly influenced developments. In fact, the company is itself the direct result of a chance meeting between Peter Lane, representing Applied Fabric Technologies, Inc., and a sales representative from DESMI in the summer of 2008. The meeting’s objective was to sell a fireboom to an Algerian company.

“I met the DESMI sales guy in Algeria when we visited the company. It turned out they had invited several vendors, but we were the only two companies willing to go the distance. During our visit, we were able to demonstrate the utility of some of the simple standards we’d helped to develop, such as the end connector design that enables different booms to easily be hooked together. I also realized that DESMI, despite its size in the world market, wasn’t selling much of its range of products in North America. So we managed to unite the two companies, and suddenly there was a lot of synergy that worked out well for both. In fact, joining together has brought several products to market that probably couldn’t have come into being without it. It’s been a really good marriage.”
OIL SPILL RESPONSE

Ro-Boom
Effective, reliable and durable oil containment boom

Speed Sweep
Heavy duty rubber boom recovery system
- collects oil up to speeds of 3 knots

Pyroboom
A solid floatation barrier

The Most Experienced Manufacturer in the World

Advanced Sweep Systems
Booms
Skimmers
Pumps
Power Packs
Workboats
Etc.

DESMI
PROVEN TECHNOLOGY
Cogeneration (Combined Heat & Power Plants, CHP) have turned out to be the most used platform as production of heat (cool) and electricity makes sense financially as well as environmentally. Initially the fuel used in many CHP’s was gas, coal and oil, now we are using a lot more renewable fuels in Scandinavia – such as biomass (wood pellets, straw etc.), solar energy, wind energy etc. However, in Denmark the first district heating scheme was built around waste, through a waste-to-energy plant in Copenhagen in 1903 – and waste-to-energy plants are still producing lots of heat. It is still very early days for Waste-to-Energy plants in the Middle East but the technology is strong in Scandinavia. As waste handling today is expensive and sometimes a cause for concern (i.e. environmentally) in the Middle East it is a logical source for heat and cool, utilizing the positive experiences and knowhow from Scandinavia. DESMI have i.e. developed pump solutions for difficult applications, such as pump installations related to cleaning of flue gas (scrubber) in such plants. The long history means authorities, consultants and equipment manufacturers in Denmark/Scandinavia have developed a strong experience and knowhow initially with District Heating and later
We have already supplied DESMI pumps for district cooling/HVAC applications at Dubai Metro Stations and Atlantis Hotel on Palm Jumeirah etc.

The Middle East economy has developed strongly over past several decades and along with the regional hot climate – the growth in both economy and population have caused a very high power generation, probably the highest per capita in the world. One of the technologies already positively transferred to the Middle East is District Cooling. This means that DESMI Pumping Technology is on “home turf” in the Middle East region where our pump solutions fits well into local schemes but often can perform with better energy efficiencies and life cycles than many our competitors. The reason being our parent company life cycles than many our competitors. The reason being our parent company – with technical support from our headquarters in Denmark – are capable of providing a variety of solutions to our customers. Aside from the pump selection and supply we can also assist with design proposals for pump station lay-out as well as we can supply various complimentary equipment and as such add value to our customers.

DESMI has i.e. district cooling/HVAC references from around the world, i.e. Scandinavia, The Netherlands, Czech Republic, Korea, Middle East/UAE, China, Hong Kong, Vietnam etc.
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