

STORIES

A single, strong, company-wide purpose defines
Wärtsilä's actions in 2014.

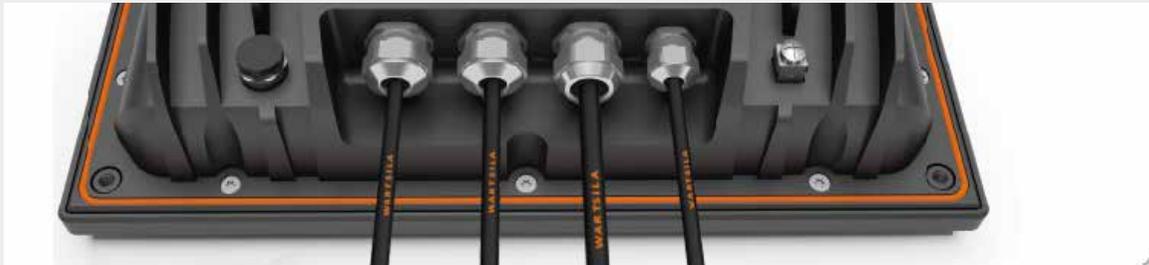


THE GAS AMBASSADOR page 3

www.wartsila.com/ar2014



ENTREPRENEURS OF INNOVATION page 8



'BECAUSE I AM A GIRL' page 13



RENEWABLE RENAISSANCE page 16

SIX WORLD FIRSTS IN SHIPPING page 19

THE BILLION DOLLAR RESCUE page 22

SUSTAINABLE SHIPPING VISION page 25

WECARE – THE NEXT STEP TOWARDS ZERO page 27

DIVERSITY MEANS PROGRESS page 29

BIOGAS CUTS OSLO'S EMISSIONS page 32

THE GAS AMBASSADOR

Wärtsilä Ship Power's "gas ambassador" expounds on the past, present and future of the shipping industry.

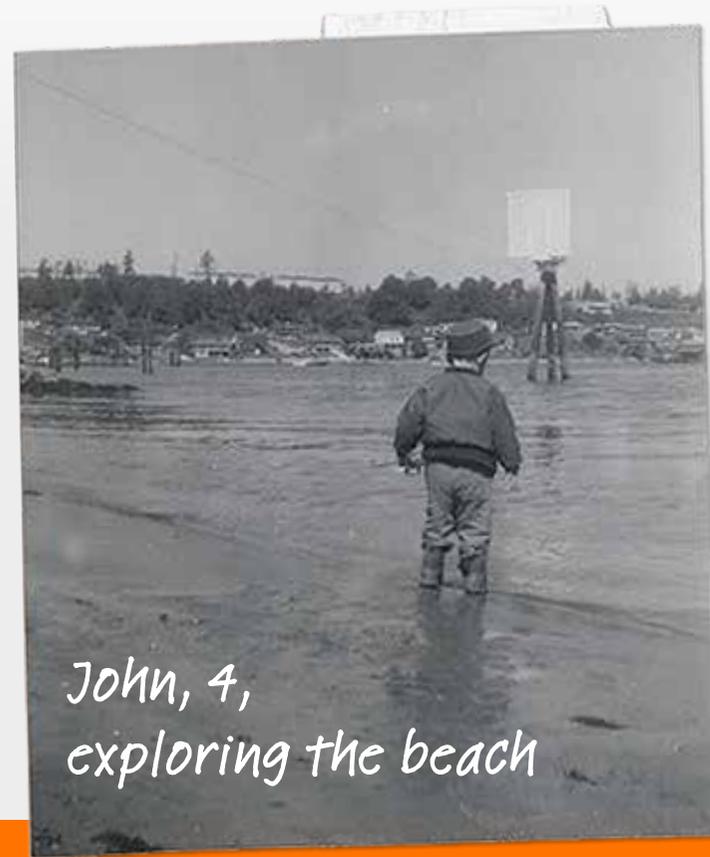
THE GAS AMBASSADOR

Born and raised on the coast in Seattle, Washington, John Hatley's life was always going to revolve around the sea. Boating ran in his family and he would see commercial traffic such as coastal freighters and barges passing by their home daily.

"I was indoctrinated from a very young age to the water," he describes, "and all the activities related to it. And as a young man I was fortunate enough to receive a congressional nomination for the US Marine Academy at King's Point."

Thus began an education that would provide John with the perfect springboard into a career in the marine industry. After graduating from King's Point in 1976 with dual licenses as a Deck and Engineering Officer and a deep understanding of entire ship systems, from bridge to engine room, another unique opportunity arose: a graduate scholarship from the Society of Architects and Engineers. He used this to pursue his developing interest in ship design, entering the University of Michigan Master's programme to study Naval Architecture and Marine Engineering.

Achieving his master's degree at Michigan in 1980 (with high honours), John began his career in a combination role, working for shipping companies and a well-known naval architecture firm. "Combining my design background with ship operations knowledge has been the give and take of my working life, and I've experienced career roles amongst several of our current customers," John explains. "So I've had a rotation in the



*John, 4,
exploring the beach*

The road to gas is paved with acquisitions

Wärtsilä's acquisition of Hamworthy plc in January 2012 enabled it to occupy a new and unique role of total solutions provider, serving the entire gas value chain. The expertise gained through the acquisition included small-scale LNG liquefaction, reliquefaction, regasification, and various LNG fuel handling technologies.

In parallel, Wärtsilä had been developing the concept of Smart Power Generation, which positions gas as a swiftly reacting complement to renewable energy

sources. Renewables typically produce drastic variations in the supply of electricity. Gas power plants equipped with our reciprocating engines can be quickly ramped up and down, or cycled, in response to these changes in demand and load. As Wärtsilä was already a technology leader in gas and dual-fuel combustion engines in the marine and power plant industries, the addition of Hamworthy's offering was significant. Bringing power plant and gas handling expertise together gave Wärtsilä a uniquely broad offering, addressing every stage of the gas value chain.

ship operations field, in the ship design field, with ship owners, investors, business development, and at shipyards, providing insights across these business windows.”

On land

In the 80s, John became more and more involved in ship operations internationally, including a period in ship construction at Samsung with sailing time as a Chief Engineer in global shipping trades. Having worked on the move and overseas a great deal, it was around this time that he began to hear the call of the shore.

“In the late 80s I found a wonderful companion for life, my wife Stephanie. At that time, I pretty much decided a good marriage is one where you can be more at home than at sea or around the world. So I came ashore and went to work for a pension fund investment company that held a portion of assets in the shipping segment for diversification.”

With work experience covering virtually every perspective possible on the marine industry, the only unconquered territory for John was management. A helpful nudge from an executive of a Fortune 500 company provided the entrance he had been waiting for.

“In the late 90s,” he says, “one of my mentors said to me: ‘John, you need to complement your deep operations and technical expertise with a business degree, and then carry this forward, merging them into business development.’ So I followed his advice, went back to graduate school and got my MBA at the University of Washington while working full time.”

Following a unique project at GE, John soon found himself in a position to exploit his entire range of skills. The offer of a senior position at Wärtsilä was both a logical step and a form of renewal. “Now I could go back and



The entire gas value chain

The gas value chain extends from the initial gas exploration and drilling processes to the production and liquefaction of LNG, which then has to be transported to storage and distribution facilities, and finally to the end users who utilise LNG in their operations. Wärtsilä has products and solutions that are relevant to each of these stages.

The main application areas of both current activity and future promise include: cargo handling equipment for gas carriers, as well as engines and

inert gas systems; small and medium sized LNG receiving terminals, which can be also offered as turnkey deliveries; complete fuel gas handling systems for all types of gas fuelled vessels; complete LNG handling solutions for small-scale LNG carriers as well as bunkering vessels; and onshore LNG production plant solutions for small and medium-sized liquefaction capacities. The terminals Wärtsilä supplies can also be integrated with power plants, another important part of the value chain, completing the circle.

put everything to use: my naval architecture training, my knowledge of ship design, and my experience with ship operations ranging from large, two-stroke engines – the most powerful engines in the world – spanning all the way down to four-stroke diesels, electrical automation, and propulsion. I went from handling a slice of the pie to a whole menu of items. So I took the opportunity and it's been terrific."

Home at last

To outsiders, Wärtsilä's position as a supplier of LNG-related technologies and services in the current gas-centric climate may seem like a strategic risk paying off. With his decades of experience in the marine industry, John seems uniquely placed to explain the company's series of fortuitous decisions. How did the role of gas in shipping shift during his career?

"In the 1970s," he begins, casting his mind back to the start of his working life, "for the US, steam was slowly undergoing a transition to diesel replacement, and in the 80s large-scale shipping relied exclusively on heavy fuel oil. There was really no thought of LNG other than as a cargo for the large ocean-going carriers, principally transporting from sources in the Middle East to the demand areas of Japan, Europe and the US."

During that era, LNG had no standing as a marine fuel, and LNG carriers utilised natural gas boil-off as their cargo tanks slowly warmed up during the extended ocean journey. As John explains, these ships also made alternative use of the gas to assist in their propulsion, initially in steam boilers, and then later, during the mid 1990s, as a fuel for reciprocating engines. This remained the case until the year 2000, when the first coastwise vessels in Norway, small ferries and off-shore supply ships, began to run on natural gas as a fuel.

"That's really when I think the coastal and port area vessels began to inherit a lot of the technologies and knowledge from the larger ocean-going carriers

that, at that time, had been operating successfully for a number of years already."

John has a way with metaphor, and sees the progress of LNG technology as generational: "The largest 50-centimeter bore gas engines were designed for the high power needs of LNG carriers crossing the oceans. That's the grandfather. The father is represented by the 34-bore gas engines, which were originally intended to serve as generator engines for steam ships running on natural gas, but soon became the choice for power generation on land. And then today's grandson: the 20-series engine, a lower-power solution for both smaller vessels and generator set applications. This latest series completes a power band that now spans a broad market: the smaller river and lake vessels, much larger vessels along the coastlines, and, with our newest low pressure two-stroke addition, the large ocean-going vessels."

The conversation, of course, soon turns to the environmental benefits of LNG, currently driving interest and activity worldwide. "Wealthy populations' demands for stronger environmental stewardship are reflected by the politicians in their regions, and they're charting our future direction. It's predicted that soon the Baltic and North Americas control areas will be joined by Japan, Australia, the Mediterranean and that others will also adopt similar measures to reduce emissions. So our customers around the world are seeing a



Infrastructure is the new frontier

Global trade flows clearly indicate a mismatch between the locations of gas resources and the consumers in need of them. This will drive investments in gas infrastructure worldwide, with significant growth in the number of importing countries generating an increase in demand for small and medium-scale receiving terminals and smaller gas carriers for regional trade.

Wärtsilä's recent project for Manga LNG Oy in Tornio, Finland, is a case in point: a turnkey contract to supply an LNG receiving terminal valued at approximately EUR 100 million. The terminal will enable the availability of LNG for industrial consumers in the Bay of Bothnia region, with beneficiaries to include shipping and road transportation companies, power and heat utilities, as well as other industrial and mining companies in northern Europe.

clear structural and societal change aimed at becoming better environmental stewards for the sake of future generations, and this expanding opportunity is moving the market growth trajectory rapidly and continuously.”

As well as the development of gas in the marine sphere, John is equally keen to point out Wärtsilä’s parallel work with gas in land-based power generation. “I wasn’t here in the 90s when the company really went in to reciprocating gas engines,” he says, “but I’ve spoken with those that were, and our initial ambition was to target the large ocean-going carriers moving LNG around the world. Gas was a substitute for lower efficiency steam-turbine engines that had been the choice from the 70s and 80s.”

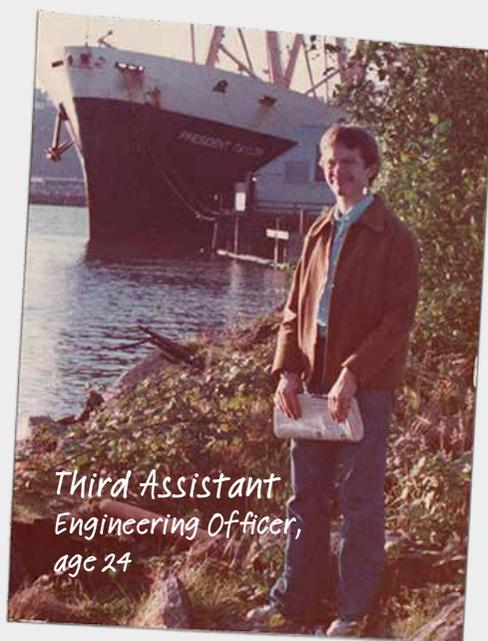
“That was the traditional choice,” he explains, providing historical perspective. “However, that technology and market space can equally apply to power

utilities, where the generation of electrical power would enjoy similar benefits from the use of gas. This is why we’ve seen gas become such a popular choice for balancing renewables. And you have to remember: the engine doesn’t know if it’s afloat at sea or on solid ground. It can function perfectly well in either case. So, in joining this company, suddenly a new market opened up to me in power generation.”

There is an infectious zeal to the way John describes the current business environment for both shipping and power generation, along with Wärtsilä’s potential within it. It’s little wonder he has earned the nickname of “gas ambassador” for the company. John’s newfound capacity to exploit the full quota of his skills evidently arrived at an exciting moment for the marine industry in general.

At Wärtsilä, he found himself in a position to witness the convergence of diverse expertise on the LNG value chain. “This company is now uniquely positioned globally, with an incredibly expansive breadth,” he enthuses. “We address the whole gas value chain from market source to consumption, covering the entire energy spectrum. Wärtsilä spans the entire range from gas receipt to liquefaction, marine transport logistics, storage, regasification, and consumption in power plants for electricity production.”

A short talk with John Hatley demonstrates that Wärtsilä approaches the market with more than just this expansive technology offering. There are passionate experts behind this story, and their actions are navigating the industry toward a new course: its destination is the sustainable age of shipping. ■



*Third Assistant
Engineering Officer,
age 24*



“Wärtsilä addresses the whole gas value chain from market source to consumption, covering the entire energy spectrum.”

ENTREPRENEURS OF INNOVATION

**Wärtsilä gains a competitive advantage by
introducing innovative industrial design solutions.**



ENTREPRENEURS OF INNOVATION

node, noun, a point at which subsidiary parts originate or centre

Stepping from the campus thoroughfare into the building that hosts the Wärtsilä Innovation Node at Helsinki's Aalto University, your first impressions are of a light, airy space. A large cafeteria dominates the lobby, and calmness seems to prevail over all the students in sight as they read, have quiet discussions over lunch, or seemingly drift quite unhurriedly from place to place.

But this superficially relaxed exterior belies the importance and intensity of the work that takes place here, just as the Finnish education system itself has consistently been ranked as one of the world's best, despite lacking the near-manic pace and rigidly enforced discipline seen in other countries seeking similar results.

The location of Wärtsilä's R&D hub on this site is no accident, as Ilari Kallio, Vice President of R&D at Ship Power's 4-stroke business line, explains to us.

"The Innovation Node's placement is one way for us to get fresh ideas and maintain a connection to society in a wider sense. For example, this is where we work with student product development programmes at the university."

"We've seen some great results," he enthuses. "We provide them with a topic related to our strategy and the students explore it from an entirely

new angle – always with the intention of developing a concept that could be translated into a new product, service or business model."

If this sounds like the introduction of entrepreneurialism into academia, that's exactly what it is. This isn't innovation for innovation's sake, as a recent project providing smartphone-based assistance for service engineers demonstrates. Using the advanced communication capabilities of handheld devices as an alternative to the storage of paper manuals and written notes to instruct new service operators, the project might very well soon see fully-fledged development into an integral component of Wärtsilä's service offering.

user experience, noun, the overall experience of a person using a product such as a website or computer application, especially in terms of how easy or pleasing it is to use

This emphasis on user experience – while it has netted billions for certain consumer technology companies – is rarely seen in the industrial sector, where performance as measured in megawatts is a more acknowledged barometer of desirability.

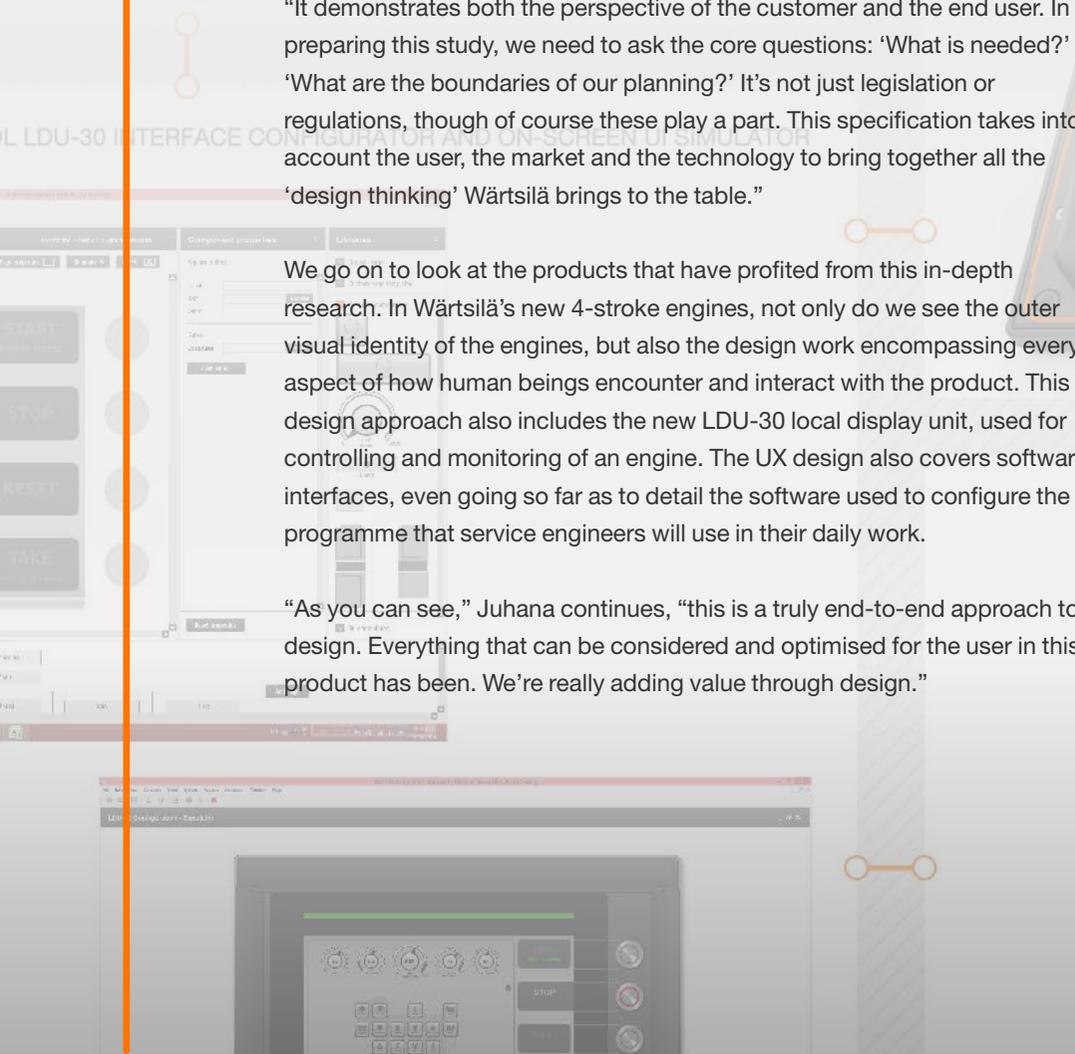
Juhana Arkio, Ship Power's Manager, Industrial Design, emphasises that this will not always be the case. "End user understanding is critical in modern business," he tells us. "For Wärtsilä, this means gaining a competitive advantage by introducing innovative industrial design solutions."

He goes on to outline the industrial design procedures that his team and himself have instituted, product by product, to bring the end user closer to the centre of solution planning.

We begin with a number of annotated diagrams collectively known as a comprehensive design specification. “This is the result of deep research into the environment in which the product will be used,” Juhana explains. “It demonstrates both the perspective of the customer and the end user. In preparing this study, we need to ask the core questions: ‘What is needed?’ ‘What are the boundaries of our planning?’ It’s not just legislation or regulations, though of course these play a part. This specification takes into account the user, the market and the technology to bring together all the ‘design thinking’ Wärtsilä brings to the table.”

We go on to look at the products that have profited from this in-depth research. In Wärtsilä’s new 4-stroke engines, not only do we see the outer visual identity of the engines, but also the design work encompassing every aspect of how human beings encounter and interact with the product. This design approach also includes the new LDU-30 local display unit, used for controlling and monitoring of an engine. The UX design also covers software interfaces, even going so far as to detail the software used to configure the programme that service engineers will use in their daily work.

“As you can see,” Juhana continues, “this is a truly end-to-end approach to design. Everything that can be considered and optimised for the user in this product has been. We’re really adding value through design.”



identity, noun, the qualities, beliefs, etc., that make a particular person or group different from others

Optimisation for the user is one of the most important dimensions to industrial design. Another is the product identity, and the way it reflects Wärtsilä's values and ambitious goals. Juhana sees this as descending directly from the company strategy.

"In industrial design, we aim to distil Wärtsilä's strategic-level drivers – lifecycle efficiency, reliability, serviceability and safety – into one strong product identity. When considering the implications of design on perception, this goes way beyond colours and where you put the logo. This is about what these devices represent and how their identity talks to people. In a way, we're giving the strategy a voice."

Pinned down to a single value he'd like to see Wärtsilä's customers perceive in product design, Ilari Kallio proposes reliability. "Establishing the idea that the company can be counted on to deliver and our products can be counted on in the field is hugely important. Everyone across the organisation works with that in mind."

entrepreneurial, adjective, having the spirit, attitude or qualities of an entrepreneur; enterprising

The fact that both Ilari and Juhana work under the banner of Ship Power's 4-stroke business line, yet have done extensive work on innovations bridging each of Wärtsilä's other business areas leads us to enquire precisely how R&D functions in the organisation.

For Ilari, the key phrase is 'entrepreneurial thinking'.

"If I see an opportunity or synergy with some other business line, there's nothing that hinders me from capturing that synergy. Even if we have our own responsibilities, it doesn't mean we can't collaborate proactively. Entrepreneurial thinking is our route to the easiest, most productive and most economical ways of working. Organisational structure doesn't have to limit collaboration if you see there is a benefit.

"It's just like running a small company: you need to find out who the best partners for you are. They could be internal partners or they could be externals. You don't have to share budget in order to share knowledge and do collaboration. It's a win-win."

Juhana picks up the thread: "We're a very small team and our agenda is innovation. The nature of industrial design is such that we often see a use for our competence across all of these business areas. Why should we restrict ourselves to a single product line? We do a huge amount of work for service business innovation, for example, where industrial design is playing an increasing role. If you look at a typical service design agency you'll find UX designers, end user researchers, GUI designers: these are the skills we have right here."

Design innovators evidently do not see corporate structure as any barrier to inventing and implementing new, beneficial solutions, but Ilari reaffirms that company strategy provides the direction for their work.

"The broad strokes are," he explains, "decided at the management level. Directions like gas, fuel flexibility and Smart Power Generation are established there. But as they pass down through the organisation, finding application in each of the different divisions and then, in turn, the business lines, these decisions translate into a huge variety of different opportunities."

“One strength we have in Wärtsilä is the capability to see where the potential lies and understand where we want to be as the market changes and new needs become visible. What kind of products do we need? What value do we bring to our customers? How do we position ourselves? There’s only one quality that can help you answer these questions: customer understanding.”

Juhana confirms that in the world of cutting-edge industrial design, the very same principle applies. In fact, it’s the basis of a powerful trend: “At any innovation seminar, at least 80% of the core content is about end-user and customer studies. In our case, though, we have to go beyond even what the customer, or anyone else, is able to tell us in the here and now.”

When all is said and done, the customer is the purpose of creating innovation. At the Innovation Node, this means finding new ways to add value at each stage of the product life cycle, and looking ever onwards to the solutions of the future. ■



Sustainability
assured 2014

'BECAUSE I AM A GIRL'

Wärtsilä's personnel helps to drive change for the better
for girls in developing countries.



'BECAUSE I AM A GIRL'

In early 2014, Wärtsilä personnel in Finland selected a charitable initiative for the company to support. The combination of a well-chosen partner, a strong group effort, and a unique internal initiative should help drive change for the better for girls in developing countries.

Supporting girls' education is one of the single best investments we can make to help end poverty. Did you know, for example, that:

- 62 million girls are unable to go to school and that every year in higher education increases a girl's future income by 15–25%.
- Every day, close to 40,000 girls get married and a third of them are under 18 years old.
- 50,000 girls die yearly because of complications in pregnancy or delivery.

Plan International's 'Because I am a Girl' campaign aims to support millions of girls in getting the education, skills and support they need to transform their lives and the world around them. Wärtsilä employees in Finland selected the campaign from a number of other worthy causes to be a joint initiative between personnel and the company as a whole.

Pushing for gender equality and improving lives

Plan International works with millions of children in 86,000 communities in 51 developing countries across the world and is continuously looking for new ways and opportunities to advance the achievement of gender equality and girls' rights.

Through the 'Because I am a Girl' campaign, Plan's projects will address the barriers to girls completing a quality education of at least nine years, as well as equip them with the assets they need to safeguard their future, promote gender equality and improve their lives.

"Collaborations like this really help to further the aims of the campaign", explained Susanna Saikkonen, Plan's Director of Corporate Partnerships in Finland. "This partnership with Wärtsilä and its employees in Finland is a very important one for us and will help both in fundraising and in spreading our message even further."

"The issue of girls worldwide in need of further education and the guarantee of a safer, healthier life is one that has an emotional impact on many people, and we were happy to find that Wärtsilä's people shared our strong feelings on the topic," she continued. "Only real passion like this can motivate such a huge undertaking."

The direct fundraising initiative

The practical arrangements of the donation programme were launched for personnel at Wärtsilä's headquarters in April, and continued onwards to Vaasa and Turku in October. These took the form of what is known as a ParticipAid programme: a voluntary charity framework.

Personnel was invited to make either a one-time or monthly donation, which would be automatically deducted from their net salary. These one-time



donations were then matched by Wärtsilä, who pledged to double every euro donated, passing on the final sum of € 27,146 to Plan in December.

This arrangement of deductions from employee salaries for charitable purposes is one of the first of its kind for Wärtsilä. Both parties hope that the combination of a well-chosen partner, a strong group effort, and a unique internal initiative will drive change for the better for the girls affected by these hardships. ■

Get involved

Find out more about the 'Because I am a Girl' campaign and make a donation: <http://plan-international.org/girls/>

"Girls' education is the best and strongest weapon against poverty in the world. Thank you to everyone who participated in the campaign!"

Ossi Heinänen, Secretary General and National Director, Plan Finland

"This was one of the first pilot ParticipAid programmes in Wärtsilä. The results and positive feedback from employees showed the importance of and need for charity activity to which we all can contribute."

Marko Vainikka, Director, Corporate Relations and Sustainability, Wärtsilä Corporation

"I am very glad that our donations will go to girls in developing countries. They are in a key position to develop their societies and get rid of poverty."

Björn Rosengren, President and CEO, Wärtsilä Corporation

RENEWABLE RENAISSANCE

How Wärtsilä technology is helping the
US power industry go green.

RENEWABLE RENAISSANCE

Operators are now discovering that Wärtsilä's quick-starting internal combustion engines provide just the flexibility they need to effectively integrate clean, green power sources.

When the Stillwater Utilities Authority, which serves a city of 46,000 in Oklahoma, was looking to update its power generation setup, balancing the peaks and troughs from wind plants had to be part of the equation. The company also wanted the ability to sell electricity to the newly established Southwest Power Pool. As it turned out, the basic needs for both were the same: a generator that can start quickly, run efficiently, and ramp up and down whenever needed.

The solution Stillwater settled on was a 56 MW power station from Wärtsilä that will consist of three 18.7 MW Wärtsilä 50SG engines running on natural gas. The contract for the project was signed in September and the plant should be up and running by early 2016.

Gary Groninger, Business Development Manager for Power Plant Sales at Wärtsilä North America, explained why Stillwater chose this technology over the more traditional combustion turbines.

"Number one is that these engine generators start fast. They start in as little as five minutes and you can shut them down and start them up again in as little as two minutes. There's just nothing that compares to that in the industry," he said.

"If you have a big combustion turbine or a coal plant of 500 or 1,000 MW, it's a big lump that you can't start and stop easily or efficiently."

Gravitating towards the sun

In other parts of the US, the renewables are different but the needs are essentially the same. Just like their counterparts in the windy Midwest, utility companies in Hawaii face the challenge of integrating a power source that is highly volatile: the sun. Solar photovoltaic (PV) input can drop at a moment's notice when the sun goes behind a cloud.

And like their counterparts in Oklahoma, the Hawaiian Electric Company has opted for Wärtsilä's fast-starting engines to fill the gap. Their new project, signed in July and still pending regulatory approval, entails installing six Wärtsilä 34DF engines with a combined output of 50 MW at the Schofield Barracks army base, about 40 kilometres from Honolulu. The plant will help the company serve its approximately 300,000 customers on Oahu, the state's most populous island.

"They need the ability to mitigate all the photovoltaic capacity that is going onto their system," explained Wayne Elmore, Director of Regional Sales for Wärtsilä North America. But, he says, there was another renewables-related issue behind Hawaiian Electric Company's move: the unique ability of Wärtsilä's reciprocating engines to operate on more than one fuel type.



The plant will initially run on a biofuel blend, but operators want to keep their options open. “Today Hawaii has no natural gas or LNG, but in the future they believe they will have LNG. This plant will have the ability to run on LNG whenever it becomes available,” Elmore said. “And not only can the engines switch fuels, they can do so while running at full capacity.”

Gaining traction

The steady rise of wind power and solar power in the US, along with the need to balance them, has certainly been creating a natural market for Wärtsilä’s reciprocating engine technology in recent years, but the corresponding sales boom arrived only in autumn 2014.

“There’s a tremendous volume of interest right now,” said Groninger. “It’s hotter here in the Midwest, but it’s picking up everywhere.”

Wärtsilä now has four combustion engine plants in the US that are over 200 MW, all of which are used for wind balancing. Their existence, Groninger says, is likely to boost customers’ awareness of the technology as well as cement the company’s position as the leading manufacturer of this type of equipment.

“We have a good head start and we have a lot of capacity already running, which is a big advantage for customers,” he said. “We’re eager to extol the virtues of this technology because it’s really exciting,” he said. “It takes time and people are catching on. This technology is finally being discovered.” ■

SIX WORLD FIRSTS IN SHIPPING

**Wärtsilä Ship Power solutions selected for several
industry firsts during 2014.**

SIX WORLD FIRSTS IN SHIPPING

2014 saw the announcement of a number of world firsts in shipping, and as a leading provider of marine technologies and expertise, Wärtsilä was involved in a number of them. In fact, when the Maritime Insight web site published an analysis of the many ground-breaking vessels that emerged during the year, six of the ten examples cited were projects of ours.

Wärtsilä Ship Power's 2014 world firsts, as described on the site, were as follows:

1. CNG carrier. *Wärtsilä will provide: engine and propulsion.*

In October 2014, Hantong signed a shipbuilding contract with CIMC ENRIC SJZ GAS to build the world's first CNG carrier, which will be operated by Perusahaan Listrik Negara, the Indonesian National Electric Company, to be used for natural gas transportation between the islands of Indonesia. The vessel will be designed by CIMC ORIC, using natural gas as power, and driven by a dual fuel main engine, with 110-meter length overall and 14-knots design speed. It is expected to be delivered in May 2016.

2. LNG bunkering vessel. *Wärtsilä will provide: engine and propulsion.*

In July 2014, Nippon Yusen Kaisha signed a contract with Hanjin Heavy Industries & Construction Co. Ltd. in Korea to build the world's first LNG bunkering vessel for the purpose of providing LNG to LNG-fuelled vessels. The vessel will be delivered in 2016, and will be based at the port of Zeebrugge, Belgium. The vessel will deliver LNG to vessels operating mainly in the North Sea and the Baltic Sea.





3. Gas-powered car carrier. *Wärtsilä will provide: auxiliary engines.*

In November 2014, United European Car Carriers signed a contract for the construction of two LNG-powered Pure Car/Truck Carriers. They represent the first such vessels globally to be fitted with an LNG propulsion system. When in service, they will be capable of completing a fourteen-day round trip in the Baltic operating solely on LNG, including main engine and auxiliary power generation.

4. LNG-powered harbour tug. *Wärtsilä will provide: ship design, propulsion, engines, LNG tank.*

Drydocks World and Dubai Maritime City entered into a Memoranda of Understanding with Wärtsilä and the Dubai Carbon Centre of Excellence for building the world's first LNG powered harbor tug. This landmark undertaking, in which the tug will have a dual-fuel engine capable of operating with both traditional MDO and LNG, will represent a major breakthrough.

5. High-speed LNG-fuelled RoPax ferry. *Wärtsilä will provide: integrated solution.*

A new passenger ferry being built for Swedish operator Rederi AB Gotland will be fuelled by LNG and will feature a Wärtsilä integrated solution. The integrated solution includes a complete LNG-powered propulsion and fuel storage and supply system, as well as comprehensive project services. This will be the first Swedish-flagged LNG-powered passenger vessel and the first LNG-fuelled high-speed RoPax ferry in the world. The vessel is being built at the Guangzhou Shipyard International yard in China and, when delivered, will sail between the Swedish mainland and the island of Gotland.

6. LNG-powered icebreaker. *Wärtsilä will provide: engines.*

A new icebreaker being built by Arctech Helsinki Shipyard for the Finnish Transport Agency will be powered by Wärtsilä dual-fuel engines capable of operating on both LNG and low-sulphur diesel fuel. When launched in late 2015, it will be the first LNG-powered icebreaker in the world. ■

Read the full article with Marine Insight's commentary on the year's most exciting new vessels at: <http://www.marineinsight.com/marine/marine-news/headline/10-major-worlds-first-vessels-announced-2014/>

THE BILLION DOLLAR RESCUE

How Wärtsilä salvaged a sunken rig and a billion-dollar contract.



THE BILLION DOLLAR RESCUE

In the closing days of 2013, Deepsea Aberdeen, a sixth-generation ultra-deep and harsh-environment rig Odfjell Drilling was putting together for BP, had sunk in its South Korean bay.

A worker on board Deepsea Aberdeen, instructed to drain a tank of water in a submerged part of the rig, had instead opened a manhole that led directly into the Korea Strait. Water gushed into the hull and spread quickly since the construction, still incomplete, had several sections open inside. Scores of personnel were evacuated without injury, but the rig sank to the seabed.

Wärtsilä had provided the rig with eight thrusters and eight diesel generators, and was in the thick of a crisis that was as serious as it was unexpected. The thrusters—propellers installed on the underside of the pontoons to help the rig maneuver and keep its position at sea—were thought to have taken the worst hit when the rig hit the seabed.

The sunken rig was already under a seven-year contract with BP, with drilling scheduled to begin in the West Shetlands in the late summer of 2014. The accident put the deal—the largest in Odfjell Drilling’s 40-year history—in jeopardy, and 1.2 billion dollars now hung in the balance.

Panic stations

For each day that the delivery of the rig was pushed back, Odfjell Drilling stood to lose over 450,000 dollars in revenue. In the worst case, this could

have meant a loss of the contract, and it was up to Wärtsilä to come up with a solution.

Installing new thrusters would delay the delivery of the rig by close to a year. That wasn’t the kind of schedule Odfjell and the local shipyard had in mind. “Repair was the only option that might meet their time schedule,” says Matias Karls, general manager of Wärtsilä Ship Power’s North Asia Sales division. Wärtsilä had to deliver the thrusters by the end of July.

In late January, a month after the incident, the on-site manufacturer brought the platform afloat again. Ten days later, divers carried out an underwater inspection that would reveal the true extent of the rescue operation. Luckily, the inspection results showed that the Korean seabed had proven Odfjell Drilling’s saviour by cushioning the impact.

Air Wärtsilä

While there was limited external damage to the thrusters, there was a lot of sea water inside of them. The underwater demountable thrusters were taken to a workshop near the Korean yard, where they were dismantled into pieces with the critical parts—like the propeller gearbox and stem section of the thrusters—were sent to Europe by air.

So far, the operation was on track. But Wärtsilä had only about three months to complete repairs on eight thrusters that had suffered significant damage.

While pressed for time, Wärtsilä closed ranks to serve all of Odfjell's needs within the huge company, with ship power and services collaborating closely. As it turned out, the quickest way to repair a platform under construction in South Korea was to spread the parts over Europe.

In mid-June, Wärtsilä began sending back the parts to the shipyard in South Korea. The sea trial was concluded in early September to make the scheduled delivery date of 10 October.

Deepsea Aberdeen—Odfjell's crown jewel, custom-made for BP to honour the largest contract in the company's history—has been saved. "The financial impact wasn't too big," says Ivar Andreas Lemmechen Gjøl, an analyst at the Norwegian investment bank Fondsfinans. "It was the best outcome in a worst-case scenario."

The rig will start drilling in the first quarter of 2015, delayed by five months, and Wärtsilä's work has not gone unnoticed. This spring, Simen Lieungh, Odfjell Drilling's CEO, spoke at Wärtsilä's customer conference and was eager to praise us. "We really felt that Wärtsilä did absolutely everything to make sure we got the quickest service and great quality," Simen said, with the delivery of the rig only weeks away.

"Odfjell is one of our key customers," says Cato Esperø, sales director at Wärtsilä Norway. "We are very happy that Simen is happy with the performance. That's what we're working on all the time: to deliver a quality product in the best possible way." ■

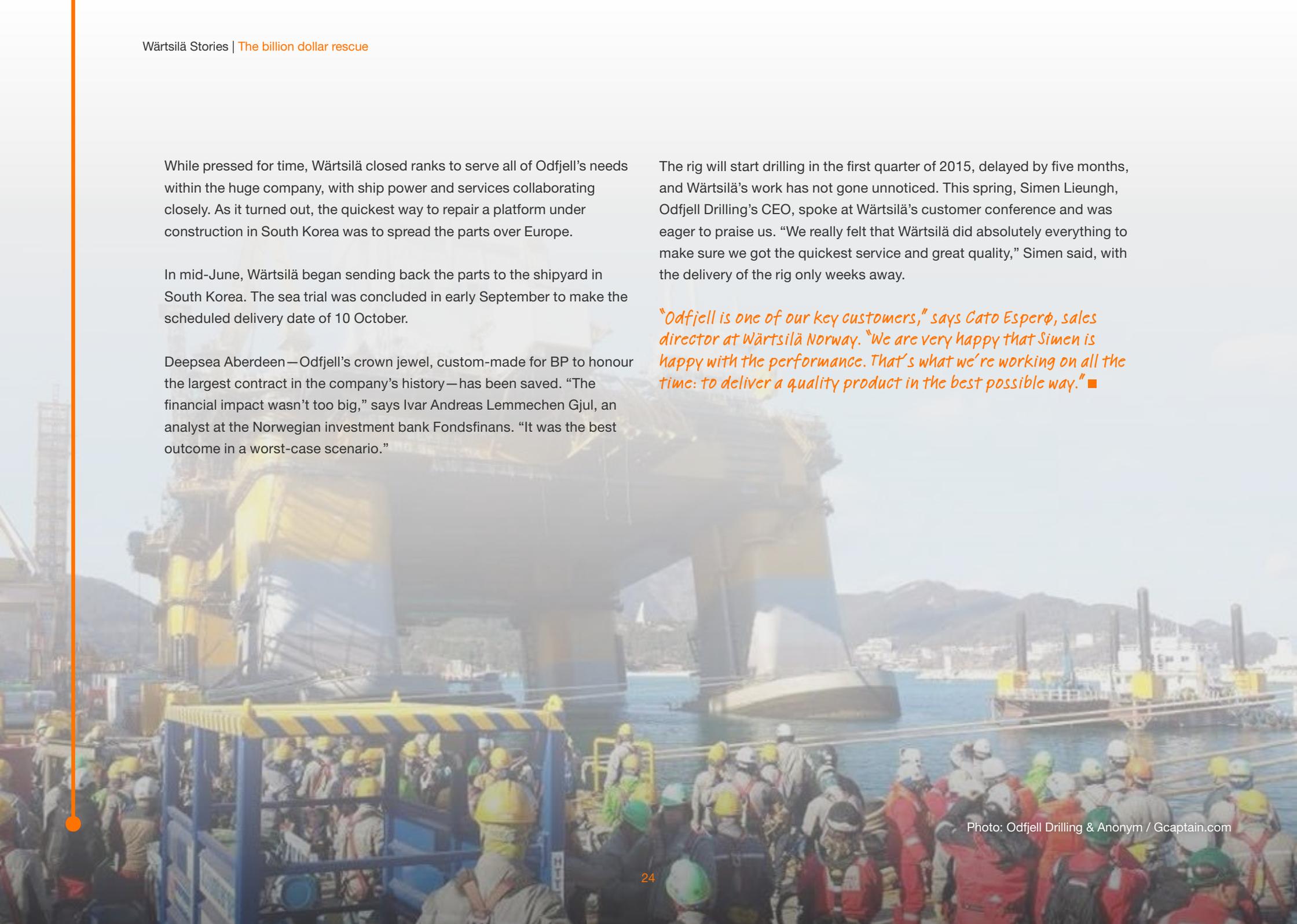


Photo: Odfjell Drilling & Anonym / Gcaptain.com

Sustainability
assured 2014

SUSTAINABLE SHIPPING VISION

Seeking to establish a dialogue with global decision makers, ship owners and other stakeholders.

SUSTAINABLE SHIPPING VISION

Shipping is one of the most sustainable means of transport available to us. In the coming years, however, as it is used to offset the emissions of less environmentally friendly alternatives, we will see the shipping industry's footprint grow significantly – even taking currently planned emissions regulations into account.

In an effort to pre-empt this trend, Wärtsilä seeks to establish a dialogue around the topic with global decision makers, ship owners and other stakeholders. Work began on a vision composed of practical themes around which sustainable development could occur.

The themes in question are fleet optimisation, total vessel efficiency, sustainable fuels and fuel flexibility, minimised emissions and vessel safety. Together, these point the way to a shipping industry suitably equipped to carry the majority of the world's cargo handling.

With an expansive portfolio of shipping solutions, Wärtsilä drew upon its own potential to provide compelling insight into vessel design and sustainability-focused technologies, but other voices are needed.

The vision, which is outlined in the accompanying video, viewable at <http://www.wartsilareports.com/en-US/2014/ar/stories/sustainable-shipping-vision/>, strongly suggests that each of the relevant parties plan the most suitable road map together. A single player or technology cannot solve this problem alone. On the contrary, societies, ship owners, solution providers

and all other stakeholders need to agree on a basis for initiatives like future-focused infrastructure, improved vessel design and more sustainable transport paradigms such as reduced-speed cargo flows.

The initiative has been well received by the target audience thus far, and the journey continues. Please take a look at the video and make your own voice heard in this important conversation.



Sustainability
assured 2014

WECARE – THE NEXT STEP TOWARDS ZERO

Introducing a new and more comprehensive programme for reporting and analysis of accidents, near misses and hazards.

WECARE – THE NEXT STEP TOWARDS ZERO

Safety is a priority for Wärtsilä, and for several years we have been moving steadily closer to our target of zero work-related injuries. We have made good progress during that time, typically managing a 20–25% reduction in incidents annually.

Maintaining this rate of improvement is particularly difficult, as the emphasis inevitably shifts from major risks to less easily perceived areas of potential improvement. To preserve the momentum, in 2014 we launched the WeCare initiative, a new and more comprehensive programme for accident, near miss and hazard reporting and analysis across the organisation.

WeCare represents a newly galvanised approach to the way we communicate about safety, both in terms of learning of incidents and the act of reporting itself. At the core of the programme is new reporting software, accessible by every employee, as well as detailed procedures governing discussion around hazards, incidents and their causes, and general accident prevention.

Analysis is also improved under the new system, with results viewable in the context of both location and business area, making trends more easily apparent.

Strong results already in evidence

WeCare's implementation began at the beginning of 2014 and by the autumn all local rollouts had been completed. 2,800 Wärtsilä employees have already participated in the program, either as an observer, an investigator or as someone responsible for taking action. This is a superb result, as the main objective of WeCare is to engage employees and encourage them to act, report and care.

A total of 5,077 incidents were reported in 2014 using the new tools. 86% of them were near misses or observed hazards.

While many of the injuries reported may be relatively minor in terms of physical harm done, these do still represent a major inconvenience both to the individual(s) involved and to the company. For these reasons we take any safety-related incident very seriously indeed. After all, remedying a hazard that contributed to a minor injury may well prevent major incidents in the future.

WeCare reporting has resulted in 3,342 improvement actions being implemented around the world to improve safety, security and environmental protection in our operations. Far from resting on our laurels, however, we continue to strive towards our ambitious goal of zero injuries. ■

Sustainability
assured 2014

DIVERSITY MEANS PROGRESS

For more effective problem solving,
diversity in the workplace is a no-brainer.

DIVERSITY MEANS PROGRESS

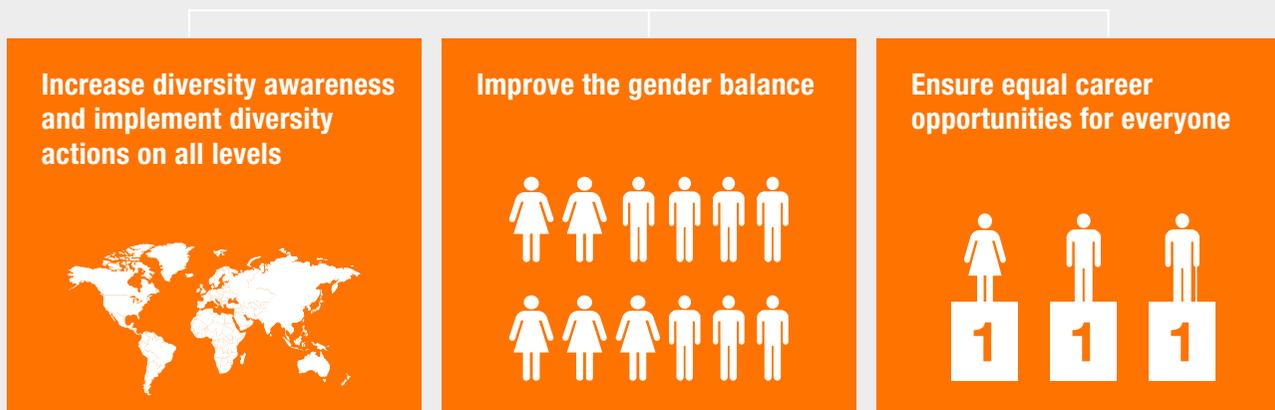
A changing business environment requires wider global presence and collaboration with varied stakeholders both within and outside the company. In terms of personnel, research shows that well-managed teams of diverse individuals often outperform homogenous teams thanks to their tendency to examine problems from different angles and arrive at more varied solutions.

As we highlighted in the 2013 Annual Report, Wärtsilä has a Diversity Initiative underway which is facilitated by our Diversity Forum, a group of employees from different businesses and locations which coordinates global actions and supports local initiatives.

Päivi Castrén, Wärtsilä's Executive Vice President, Human Resources, captures the company's attitude to diversity development in a nutshell: "We don't see diversity as a box to be ticked or 'another thing to do', but rather a complete attitude shift that will gradually become absorbed into our way of working."

Following the opening phases of organisation and internal research, the forum began a programme of benchmarking with other companies such as Volvo, Accenture and Colgate. To further this collaborative approach to learning and advancement in the topic of diversity, Wärtsilä joined Corporate Responsibility Network FIBS during 2014, a non-profit Finnish

Goals of Wärtsilä's Diversity Initiative



organisation that helps companies to promote financially, socially and ecologically sustainable business. Members of the Diversity Forum attended FIBS' annual Diversity Charter seminar in October and a benchmarking meeting for a group of members was hosted at Wärtsilä's Helsinki headquarters on the following day.

Changing attitudes

With internal research and external benchmarking well underway, the Diversity Initiative is now focused on the next phase of its activities: communication and awareness building within the company. The momentum will thereby shift from the corporate office to managers across the organisation, with both the Diversity Forum and local HR personnel supporting them with material, guidance and ideas when needed.

While the initiative is working with ambitious targets (Wärtsilä aims to increase its female employees to 20% of total by the end of 2015), Päivi is emphatic that quotas and similar measures would be an inadequate means of achieving them.

"This is a topic that needs to develop in the minds of our people, not just on paper with strict, enforced instructions. By keeping the topic alive and continually emphasising the advantages of diversity to our employees, the change will come from them. We've already shown the business benefits: now it's time to see them in action as the learnings take root." ■

Sustainability
assured 2014

BIOGAS CUTS OSLO'S EMISSIONS

Wärtsilä's gas offering helps Oslo to become a pioneer
in environmental innovation.

BIOGAS CUTS OSLO'S EMISSIONS

The EU aims to reach a level of 20% renewable energy production by 2020. To facilitate this, member nations, regions and municipalities are looking beyond the traditional options to find new ways of providing for their citizens' energy needs.

In Norway, an even more ambitious target has been set. The country plans to be the first state in the world to become "carbon neutral" and cut its net greenhouse gas emissions to zero by 2050. One of the tools they have adopted to assist in these efforts is liquid biogas, a fuel solution derived from recycling of biowaste.

As detailed elsewhere in this report, Wärtsilä's gas offering has expanded into gas-handling systems and infrastructure solutions such as bunkering and terminals. In 2014, Wärtsilä demonstrated yet another facet of its gas offering by delivering a biogas liquefaction plant to serve Oslo's public transport system. Wärtsilä's customer in this case is Norwegian Cambi AS, the Municipality of Oslo's EPC provider and a specialist in biowaste treatment.

Setting trends

"The effects of this process on the Oslo city transport ecosystem are huge," explains Dr. Arne Jakobsen, Business Development Manager at Wärtsilä Norway. "135 buses in the Oslo region will be able to run on the fuel provided by this plant, resulting in CO₂ reductions of 10,000 tons a year, not to mention particle emissions."

The plant employs a bacterial process to produce biomethane from household food waste collected from Oslo. 50,000 tons of waste will be treated each year to produce around 14,000 Nm³ of biomethane daily.

This gas is cleaned before being refrigerated and condensed into liquid form with Wärtsilä's Mixed Refrigerant technology. Wärtsilä's responsibilities at the plant also include feed gas compression, biogas cleaning, and liquid biogas storage and export systems.

With the introduction of biomethane into its transport ecosystem, Oslo establishes itself at the forefront of urban environmental innovation. As a benchmark for cities across Europe and the rest of the world, the new plant makes a very compelling case indeed. ■

